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VEHICLE ACCIDENT PREVENTION AND ALERT SYSTEM

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Abstract: As the usage of vehicles is increasing drastically, the hazards due to vehicles is also increased. The main cause for accidents is high speed, drunk and drive, diverting minds, over stress and due to electronic gadgets. This paper deals with accident detection system that occurs due to carelessness of the person who is driving the vehicle. This introduces accident alerting system which alerts the person who is driving the vehicle. If the person is not in a position to control the vehicle, then the accident occurs. Once the accident occurs to the vehicle this system will send information to registered mobile number. Speed is one of the basic reasons for vehicle accident. Many lives could have been saved emergency services could get accident information and reach in time. This project deals with accident detection system when the accident occurs it uses various components and alerts the Rescue team for help. An efficient automatic accident detection with an automatic notification to the emergency service with the accident location is a prime need to save the precious human life. The proposed system deals with accident alerting and detection. It reads the exact latitude and longitude of the vehicle involved in the accident and sends this information to nearest emergency service provider. The goal of the project is to detect accidents and alert the rescue team in time.

Index Terms - **Vehicle, GSM, GPS, Alert, Rescue.**

I. INTRODUCTION

The main goal of our project is to build an IoT tool that may be used in coincidence detection and alerting the nearest clinic via an SMS. The net of factors (IoT) is the time period used to refer to the conversation among people to matters and matters to matters. In nowadays society, technology is improving at an exponential price. Broadband net is more broadly to be had and greater fee-green than ever earlier than. All of these things are creating a ripe environment for IoT.

Currently, many vehicles are geared up with an automated crash response system that can communicate with a server inside the Cloud alerting a paid company of an emergency. Once the company has been alerted, an operator communicates lower back with the motive force to get further instruction and sends emergency employees if important. This task proposes a gadget which can eliminate the want for an operator. Whilst the vehicle is in a twist of fate it communicates without delay with emergency offerings and family participants giving the severity of the accident, GPS vicinity. Ambulances are currently able to sending affected person statistics to the sanatorium.

The distinctiveness of this assignment is that sensors stumble on an accident and information is sent without delay to the ambulance, as a consequence casting off the want for an intermediary step. In created nations like India with advance transportation, innovation should assist with contacting individual in most limited time to spare lives. Facilities take care of certain sufferers and elderly individuals who, because of flexibility troubles, are at risk for falls, and can require quick reaction inside the occasion of a disaster. In this challenge we are utilizing internet of things (IOT). IOT is a rapidly creating improvement to offer statistics correspondence using simplicity and imperativeness worthwhile used in the vehicle. Net of things (IoT) groups reshaped the manner in which individuals impart and brought a exchange in attitude to open and personal administrations. This challenge passes on an awesome and reliable IoT framework answer for in a flash informing the Open properly-being association at something factor a coincidence takes place and pinpoints its geographic facilitates on the guide.

II. LITERATURE SURVEY

Every software program software improvement calls for the survey technique. The Survey approach wanted to get the requirement to the software. The Survey includes reading the present system and it has read approximately the gear needed for the development of the software program. A right expertise of gadget is very lots vital. Literature survey is a technique for the identification of the troubles via studies and proposing the improvement of the tool to clear the issues of gift machine.

Authors[1]offers an IoT-based totally automobile accident detection and classification (ADC) system, which uses the phone's integrated and related sensors are not located but in addition to document the form of coincidence. This approach improves the rescue efficacy of diverse emergency offerings, which encompass immediate clinical services fire stations, towing services, and so on., expertise about the various of twist of fate is fairly treasured in making plans and execution of rescue and relief operations. The emergency servers companies can higher equip themself in step with the state of affairs after making an inference approximately the accidents sustained via use of the patients and the harm to the automobile

Authors[2] proposes an automatic IoT based accident detection tool. Right now, after an incident, the data facts dispatched to the user, immediate SMS is forwarded to the victim buddies and also send the information to the applicable authorities such as web page site visitors control room, close by police station, ambulance carrier. To assess the overall performance of the gadget. The spot acquired after a thorough integration and device trying out demonstrates that the proposed gadget not handiest achieve the purpose of the studies however it can deliver expected very last outcomes in a rather charge-powerful manner.

Authors[3] describes the feasibility of vehicle with technology that come across the accident and alert the emergency employees. When there may be a vehicle coincidence a person has to actively are seeking assist which include calling 911 for immediate services. There is no computerized notification to the police, ambulance, pals, or family. The net of factors (IoT) can be used to supply an automatic notification and reaction to the scene. A signal from an accelerometer and a GPS sensor are routinely despatched to the cloud and from there, an alert message will be received by whoever is subscribed to that car. The signal indicates the severity of the coincidence and the GPS place. The ambulance use the GPS location to get to the accident place.

Authors[4] describes crashes are a prime public fitness problem as they create approximately giant lack of lives, assets, and time. Medical assist given right away will keep many lives. This paper offers a clever mishap detection and caution device that notifies the emergency contacts of the purchaser while a mishap takes place through sending a message with the detected region. At the point even as the auto is in a mishap, the automobile's sensor distinguishes it right away and sends the SMS to the contacts. Then the reset button is pressed to prevent the alarm from being sent to the catastrophe contacts in an occasion in which anyone within the vehicle is safe.

III. SYSTEM IMPLEMENTATION

The figure 1.1 shows the block diagram of our proposed system. Initially the mobile hotspot connection has to be connected to the device with SSID: accident alert and Password: 12345678. Then adaptor is connected to the device. Then user has to wear the eye blink goggles then eye blink corresponds to onboard led, we can check for accident detection and drowsiness detection.

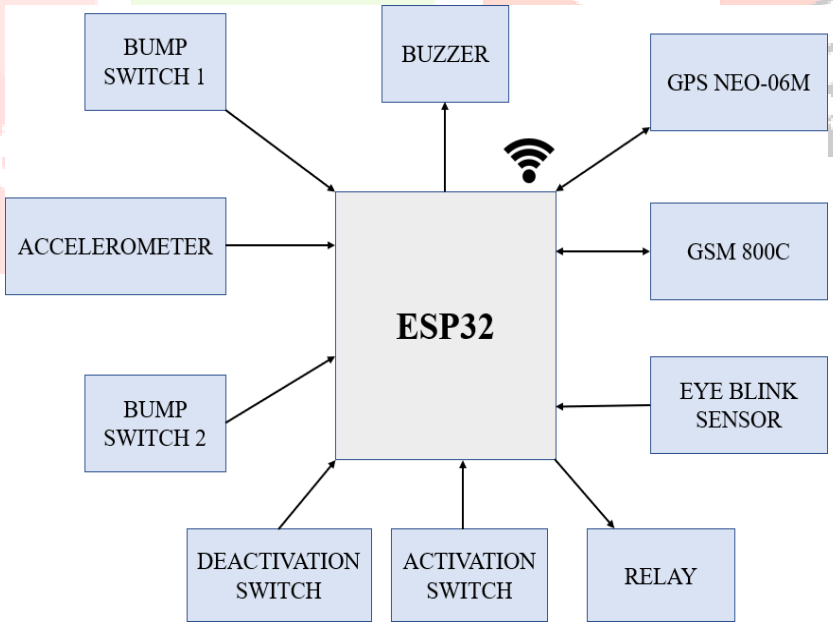

Figure 1.1: Block Diagram

For drowsiness detection the user has to wear the goggles, if the user closes his/her eyes for 4 seconds then the buzzer rings and vehicle are in still ON condition likewise if the user closes his/her eyes the buzzer rings again and vehicle is still in ON condition if it happens for the third time the buzzer rings and immediately vehicle gets OFF and SMS and location is sent to the registered number through GSM and sent to the cloud through SQL database.

For the purpose of accident detection, in our proposed system there could be two bump switches planted on the front and rear part of the car. If any collision or accident takes vicinity then bump switches will trigger an alarm or buzzer sound. If the consumer presses the button inside 6 secs of collision, then device will turn off the buzzer. If the person doesn't press the button within 6 secs, then an SMS will be dispatched to registered mobile range through GSM 800c module and gadget will fetch the actual-time location of the consumer via GPS module and send it to the cloud even though NodeMCU. The system will retrieve the area from the cloud and apply the KNN algorithm and ship a notification to the nearest health center with the help of GSM module

IV. TOOLS AND TECHNOLY USED

1. .Overview of Arduino

Arduino is an open-source software and hardware corporation, assignment and person network that manufactures and design microcontroller kits for the purpose of build the digital gadgets. The hardware products of arduino are licensed beneath a CC-through-SA license, even as software of Arduino is licensed underneath the GNU Lesser preferred Public License (LGPL) or the GNU preferred Public License (GPL), permitting the manufacture of Arduino forums and software program distribution through all and sundry. Commercially Arduino boards are available from the legitimate internet site or via authorized vendors.

Variety of microprocessors and controllers are used by Arduino board. The forums are equipped with sets of virtual and analog I/O pins that can be interfaced to diverse enlargement forums or breadboards and other circuits. The boards characteristic serial communications interfaces, which includes usual serial bus (USB) on some models, which are extensively utilized for loading programs. The microcontrollers may be programmed the usage of the C and C++ languages, the usage of a wellknown API which is likewise called the "Arduino language". Further to the usage of traditional compiler toolchains, the Arduino undertaking gives an included development environment (IDE) and a command line tool (arduino-cli) advanced in cross.

The Arduino project started in 2oo5 as a tool for the students on the interaction layout Institute Ivrea in Ivrea, Italy, aiming to provide a low-value and clean manner for novices and experts to create gadgets that have interaction with the surrounding the usage of sensors and actuators. Common are the examples of such gadgets intended for novice hobbists include simple robots, thermostats and motion detectors.

2. Bump Switch

Figure 2.1 shows bump switch, this is the simplest sensor you can locate for impediment and collision sensing. It is essentially a transfer with an extended take care of (can be expand with outdoor lever for better performance) which closes the transfer on every occasion it collides with an obstacle. It's miles of small duration and comes in a SPDT package deal. It is straightforward in working and easy to use. May be effortlessly interfaced to microcontrollers and outdoor circuits

Figure 2.1: Bump Switch

3. GPS Module

Figure 2.2 shows GPS Module. It contains tiny antennas and processors that right away acquire data dispatched by satellites via devoted RF frequencies. It will accumulate timestamp from each visible satellite tv for pc, in conjunction with different portions of statistics. The module's antenna can spot more satellites, it is able to appropriately calculate the function and time.

Figure 2.2: GPS Module

4. GSM Module

SIM 800C Module is a whole Quad-band GSM/GPRS solution in a SMT kind, it may be embedded in the patron packages. This module is a sub-device of net-of-the entirety hardware

SIM800C helps Quad-band 850 or 900 or 1800 or 1900MHz, it could transmits the Voice, SMS and records having low strength consumption. With tiny length of 17.6x15.7x2.3mm, it will easily in form into slender and compact desires of purchaser layout.

Figure 2.3: GSM module

5. NodeMCU

NodeMCU is an open-supply firmware for the open-source prototype board design are available. The "NodeMCU" combines "node" and "MCU" (micro-controller unit). The word "NodeMCU" strictly talking defines the back to the firmware in preference to the related development kits. Figure 2.4 shows the NodeMCU. Each the firmware and prototype board design are open supply. Lua scripting language was used by the firmware. The firmware is based on the eLua undertaking, and build on the Espressif Non-OS SDK for ESP8266. It also use many open deliver initiatives, at the side of lua-cjson and SPIFFS. Because of constraints, customers want to select the modules applicable for their mission and construct a firmware tailor-made to their wishes. Support for the 32-bit ESP32 has been additionally applied. The prototyping hardware usually a circuit board functioning as a twin in-line package (DIP) which integrates a USB controller with a smaller floor-installation board containing the MCU and antenna. The selection of the DIP layout permits for smooth prototype on breadboards. The layout became first of all based totally absolutely at the ESP-12 module of the ESP8266, this is a wi-fi SoC integrated with a Tensilica Xtensa LX1o6 middle, broadly used in IoT programs

Figure 2.4: NodeMCU

6. Buzzer

The buzzer consists of an out of doors case with pins to connect it to power and floor. Inner is a piezo detail, which includes an extensive ceramic disc surrounded by the usage of a metal (frequently bronze) vibration disc. When modern-day-day is carried out to the buzzer it reasons the ceramic disk to contract or extend. The buzzer is a sounding tool which can convert audio alerts into sound signals. It's miles broadly utilized in alarms, computer systems, printers and distinct digital products as sound gadgets.

7. Accelerometer

Figure 2.5 shows the accelerometer. It is also called as Vibrator Sensor. It referred to as a piezoelectric sensor, has many types which can be used to measure the acceleration, stress, vibration adjustments of the device or machine. It can used with an Arduino or Raspberry Pi thru the MEMS vibrator sensor modules which might be common these days. This lets in for vibrator sensor packages to be effortlessly fulfilled in a small and accessible shape trouble

Figure 2.5: Accelerometer

8. Eye Blink sensor

The eye blink sensor illuminates the eye with infrared light and monitors the changes in the reflected light. The infrared light reflected from the eye is used to determine the results. The sensor output is active high for Eye close and can be given directly to nodemcu.

9. Relay

A relay is an electrically operated switch. It consists of a set of input terminals for a single or multiple control signals, and a set of operating contact terminals. Figure 2.6 shows the relay. Relays are used where it is necessary to control a circuit by an independent low-power signal, or where several circuits must be controlled by one signal

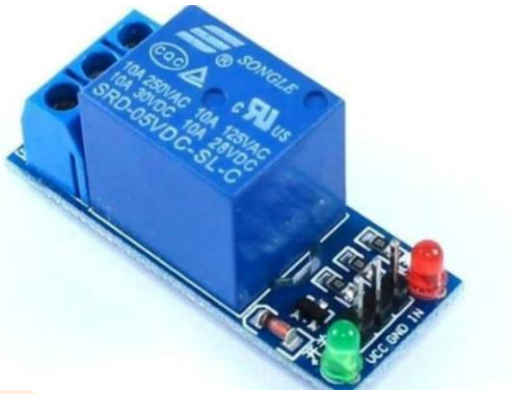

Figure 2.6: Relayr

Software Program Requirement Specification

Software program Requirement Specification (SRS) was essential records, which shapes the installed order of the software improvement manner, it facts the requirements of a framework further to has an define of its massive components.

The focal point on this diploma is one of the clients of the system and now not the tool. The end result of the requirement specification report states the purpose of the software program, homes and constraints of the preferred system. SRS constitutes the information among customers and architects with understand to the substance of the product as a manner to be created. It has to be specific and clearly symbolize the framework conditions as it makes a massive commitme2nt to the general improvement plan.

One of the maximum important information is SRS (software program Requirement Specification). It gives the particular statistics approximately established order of software application development approach. It records the important necessities of the frame paintings additionally holds the depiction of the crucial additives. These items can be within the IEEE necessities. The pointers could form the explanation at the back of giving clean photo of the item to be made filling in as measure for execution of an information among patron and the developer. One of the essential steps involved within the development procedure is gadget necessities. This SRS (software program software Requirement Specification) is discovered after aid analysis section. Its most important project is to determine what a software program software product does. In this level the main attention is the person, and no longer the machine solution. SRS (software program software Requirement Specification) gives the effects like aim of the softwares software, residences and constraints of the desired machine. The primary gain of SRS (software Requirement Specification) is that it offers a clean understanding some of the clients and the product builders with appreciate to the product this is superior. SRS (software program Requirement Specification) that is documented have to accurate and the conditions of the frame paintings should be signified because it makes large willpower to the overall development plan method.

V. RESULTS AND DISCUSSIONS

The below figure shows the hardware implementation of the project where the Arduino is integrated with the components such as accelerometer, vibrator sensor, GSM, GPS modules. In this an accelerometer or vibrator sensor is used to detect the accident and then GPS will identify the location and then GSM will establish the network connection so with the geolocation can be sent to the registered mobile number

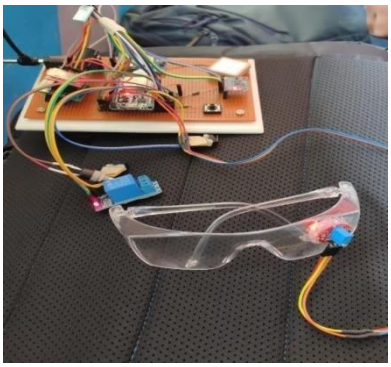

Figure 4.1: Overview of the model

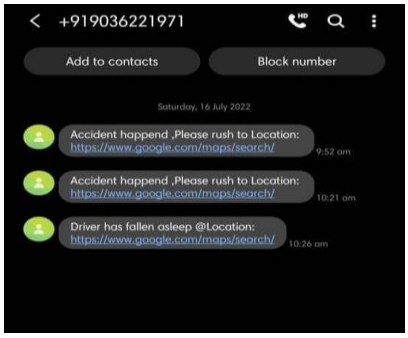

Figure 4.2: Snap shot of Alert message

VI. CONCLUSION AND FUTURE WORK

Conclusion

IoT is a hastily developing location of era, and it is been efficiently deployed in an automobile and a few assessments have been achieved. Upon accident cause, notification and GPS location have been automatically sent to the cloud. The notification of accident modified into immediately dispatched to cells telephones and the GPS location come to be made to be had for all and sundry with the registered credentials to get right of entry to. The proposed device is developed to shop lives by way of having emergency employees responds to the curl of destiny scenes faster, further for the tracking the felons who determine to flee the region of a twist of fate wherein they were involved.

Future work

In the future, the machine may be made more at ease and efficient via learning approximately unique IoT technologies. Seeing that our relay machine hardware and software primarily based generation and there is a possibility of those sensors or gadgets can destroyed themselves within the twist of fate and can generate misguided reading and consequences. So, such hardware's are required which won't be broken after the accident and produce accurate data.

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