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ARM 7 BASED CONTROLLER AREA NETWORK FOR ACCIDENT AVOIDANCE IN AUTOMOBILES USING MEMS

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ABSTRACT

Advancement in technologies to have a amazing vehicular enjoy safety machine is very essential in cars. Accident can occur everywhere every time consequently there may be a need to shop human lives from an accident by means of detecting a mishap before it takes place. As traffic hazards and road accidents are increasing every day it reasons big loss of lifestyles and belongings because of the bad emergency centers. The paper is aimed in advancements in vehicles for making it greater interactive and shrewd for averting injuries on roads. As an improvement to protection systems a multi-sensor, like ultrasonic sensor distance measurement of vehicle to vehicle and MEMS sensor its controlling of vehicle rotations like lift ,right ,forward and stop condition by using ARM-7 microcontroller. In order to prevent from accidents different sensors are used to observe fatigue levels of driver, MEMS technologies for faster communications make the system completely reliable, safe, and stable and it attains the expected result of real-time analysis of data very effectively to provide a safer drive

Keywords*: Arm7 Board, Lcd,L293d Driver Ic Dc Motor, ultrasonic sensor, mems sensor*

I. INTRODUCTION

Main motive of this mission is to prevent accidents. Accident preventions are taken care with the help of computerizedbreaking device the usage of ultrasonic sensor, its function based totally on ultrasonic wave.After transmit with the aid of transmitter, the wave can mirror while obstacle detected and obtain via receiver. The primary goal forthis mission is motors can routinely braking because of limitations whilst the sensor senses the barriers. The braking circuitcharacteristic is to brake the auto mechanically after received sign from the sensor. To prevent these injuries of vehiclesfrom taking location we're using Ultrasonic Sensors.Now a day, many accidents are going on due to the alcohol intake of the driving force or the individual that is usingthe vehicle. Thus drunken riding is a most reason of accidents in nearly all international locations everywhere in the international. To avoid it,we've implemented, “Drunk and riding detection”. We have integrated alcohol sensor with our device so one canhit upon alcohol continuously. Once it's miles detected, system will trigger message to circle of relatives character.Even using those prevention measures, there are probabilities of incidence of injuries. Today, it's far very tough to findthat an accident has passed off and to find the position in which it the accident

befell. It's greater hard for the lives ofvictims until any individual know the information and informed it to the emergency automobiles like ambulance or to hospitalsand if it takes place in faraway regions it'll becomes no hope to live on identity module carries a MicroElectro Mechanical System(MEMS), At the moment of twist of fate, the vibration sensor or MEMS or hearth sensor detects the twist of fate gives theinformation to the microcontroller, so that you can show the data on LCD,

II. EXISTING SYSTEM

Bluetooth Communication technology are used to track the objects, In older technology.

III. PROPOSE SYSTEM

But in proposed machine the same utility we will enforce by the usage of mems sensor with this sensor we can discover the place by way of the use of and also we will use the identical mems programs like sensing three directions x,y,z Etc. And also we are able to save you the coincidence by way of the use of ultrasonic sensor based on the object distance the automobile will mechanically managed itself.

So that the ambulance can attain the spot in time and human existence can be saved and the accident vicinity is diagnosed sends the twist of fate location straight away to the foremost server. The predominant server reveals the nearest ambulance to the accident region and sends the precise coincidence location to the emergency car. The manage unit video display units the ambulance and gives the shortest direction to the ambulance. This scheme is absolutely automatic, thus it locates the coincidence spot appropriately, offer the shortest route to reach the vicinity and to the medical institution in time.

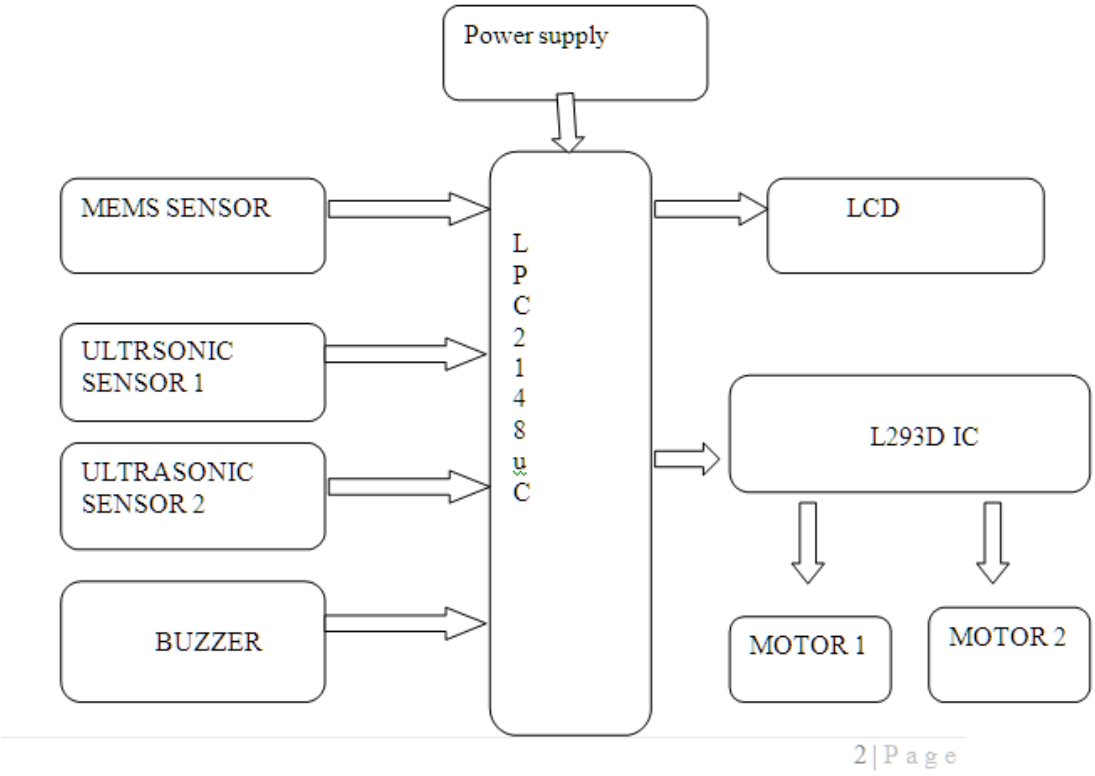

Fig1: Block diagram

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IV. HARDWARE REQUPIREMENTS

LPC2148 MICROCONTROLLER:

The ARM7 (advanced RISC gadget) pressers board primarily based complete on a 16/32-bit ARM7 its method of sixteen/32-bit ARM7 TDMI-S microcontroller, 8 computer reminiscence unit to forty pc reminiscence unit of on-chip static RAM and 32 laptop memory unit to 512computer reminiscence unit on-chip flash memory; 128-bit In- gadget Programming (ISP). 32-bit timers/out of doors occasion counters, PWM pulse width modulation unit (six outputs) and watchdog, Low electricity of actual-Time Clock (RTC), a couple of serial interfaces which has 2 UARTs , fast I2C-bus (400kbit/. There are sixty 4 pins of ARM7 processer and a couple of ports (port0, port1) forty five pins are enter/output.

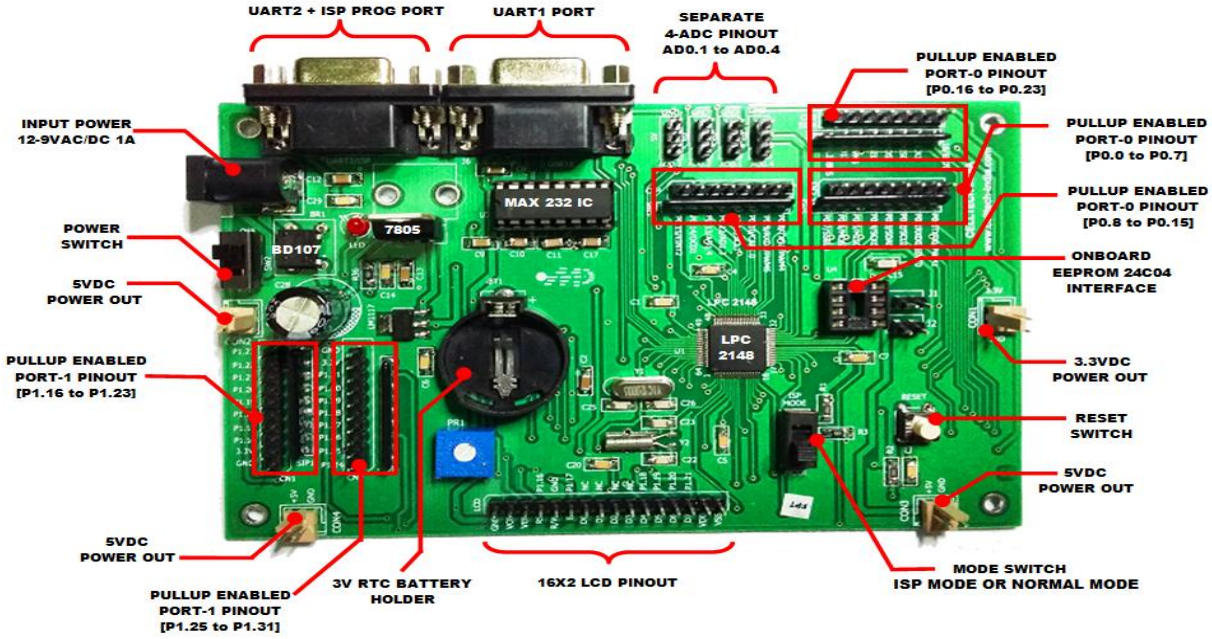


Fig2:-LPC2148 board

L293D:

The L293D is a quadruple high-contemporary half-H drivers, it also called as line driver circuit. The L293d is designed to offer bidirectional power currents of up to at least one A at voltages from 4.Five V to 36 V. The motive force carries definitely sixteen pins, in that four pins for enter and four pins for output. The output pins are linked to the vehicles and input pins are takes from the controller and l293d incorporates energy supply pins and two ground pins. The foremost use of the l293d IC is in addition up the voltage stages to run the D.C motor. Here we are taking the four enter pins and four output pins, the D.C motor calls for simplest pins so we will run two cars at a time by the use of the l293d driver IC.

DC MOTORS:

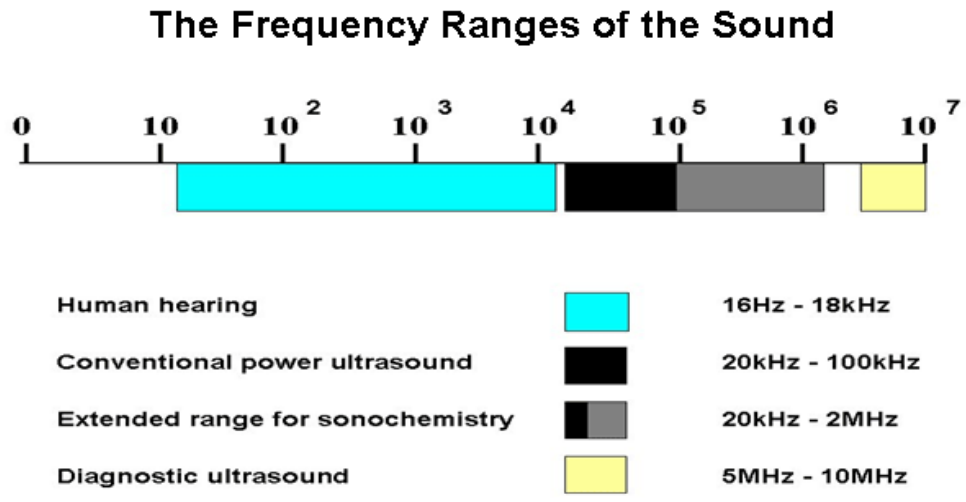
Motors are electro mechanical gadgets which are used for to transform the electrical alerts into mechanical indicators. The all D.C cars are having identical internal mechanism, both electromechanically to exchange the direction of modern-day

glide in a part of the motor. In venture we're used for to transport the motor in unique course. We need to connect the motor to controller thru driving force IC handiest.

Fig5: DC motor

Ultrasonic Sensor

Ultrasonic sensors are gadgets that use electric–mechanical energy transformation, the mechanical electricity being in the form of ultrasonic waves, to measure distance from the sensor to the goal item. Ultrasonic waves are longitudinal mechanical waves which excursion as a succession of compressions and rarefactions along the direction of wave propagation via the medium. Any sound wave above the human auditory range of 20,000 Hz is referred to as ultrasound. Depending on the form of application, the form of frequencies has been notably classified as tested within the discern under:



When ultrasonic waves are incident on an item, subtle reflected picture of the power takes place over a large solid angle which might be as high as one hundred eighty stages. Thus a few fraction of the incident energy is contemplated once more to the transducer inside the shape of echoes and is detected. The distance to the item (L) can then be calculated thru the speed of ultrasonic waves (v) within the medium by means of the relation

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Fig 6: ultrasonic sensor

MEMS (Micro-Electro-Mechanical Systems)

The Free scale measuring device consists of a MEMS electric phenomenon sensing g-cell and a image learning ASIC contained in a totally unmarried bundle. The detector is sealed hermetically at the wafer stage using a bulk small machined cap wafer. The g-cell may be a mechanical systems from semiconductor materials mistreatment protecting and etching procedures. The tool are frequently sculptured as The ASIC makes use of switched electric condenser techniques to live the g-cell capacitors and extract the acceleration expertise from the distinction among the two capacitors. The ASIC additionally signal situations and filters (switched capacitor) the sign, imparting a digital output it's proportional to acceleration.

Figure 7: MEMS sensor

V. SOFTWARE DESIGN

In this proposed contrivance, as we tend to used LPC2148 we wish to use following software package instrumentation to program for it.

1. Keil4 Vision
2. Flash Magic

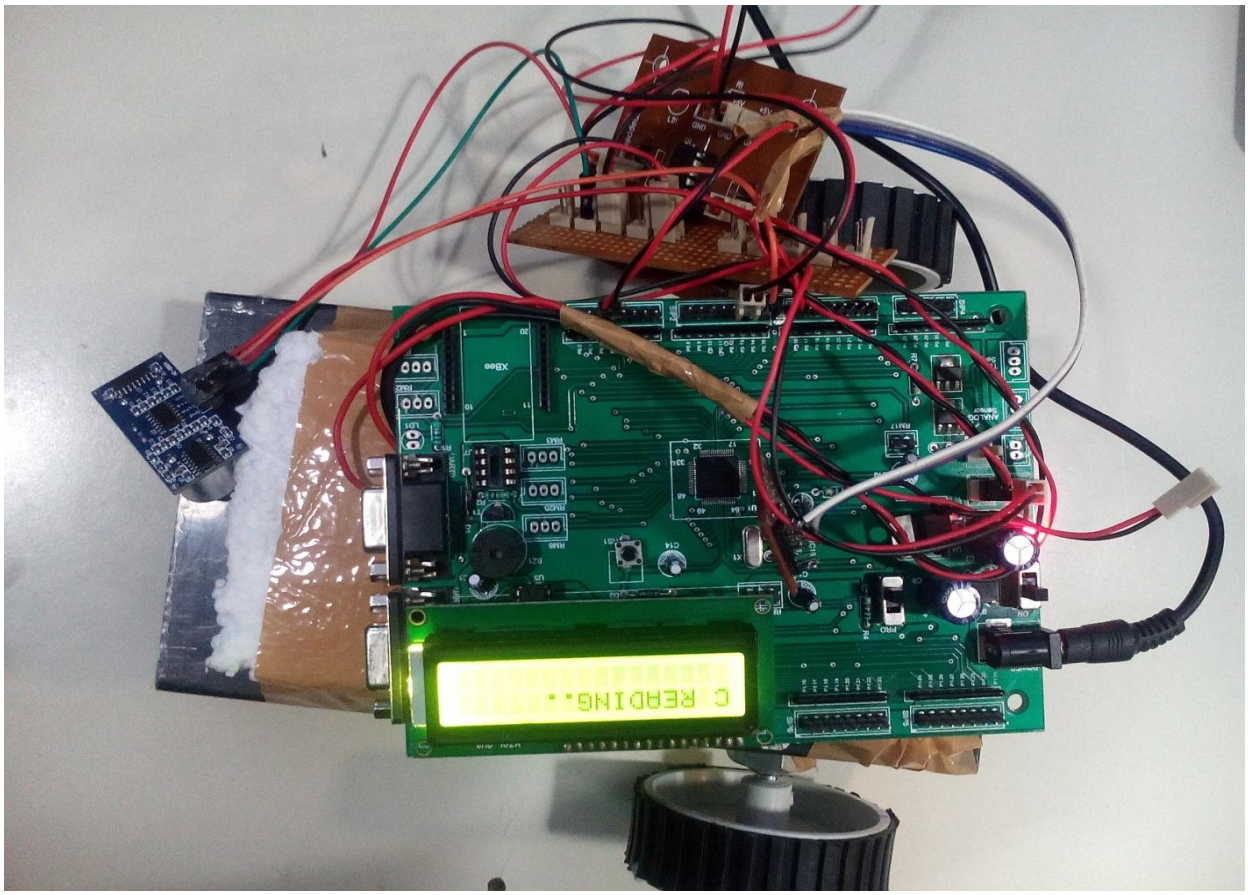
The Keil4 Vision an IDE for Embedded c language. In this IDE, we desire to import the utilities and libraries consistent with the controller. This IDE may be very more without difficulty and in consumer pleasant thanks to apply, assemblers, and debuggers in it. It simplifies the manner of embedded simulation and trying getting into conjunction with Hex file generation. The flash magic is a programming software. The C/C++ software written in IDE could be processed into Hex record i.E. In .Hex layout. By the use of hex report we have a tendency to products the code into microcontroller and carry out utility.

VI.WORKING PROCEDURE

The primary goal of is to layout an ARM based totally MEMS based fate preventions, detection and monitoring system. In thisventure LPC 1768 processor is used. When an accident happens, MEMS receives disturbed and sends output sign to theprocessor LPC1768 in order that the location is identified with ultrasonic sensor. Our work additionally sensor which will detects the distance. In which any object is present in this region.As the ARM processor calls for 3.Three volts of deliver, so a step down transformer of 230/12V is used to get the desiredAC output. To convert that AC deliver to DC supply is performed by means of using rectifier. DC output includes ripples, to removethose ripples we use filter capacitors. To get output voltages of +5v & +12v we're the use of voltage regulators 7805 &7812. Finally three.3v is given to the ARM processor for functioning. ARM processor includes modes of operation. program mode and run mode. Program mode is used for dumping of this system into ARM processor from anyexternal tool inclusive of pc. Run mode is used for the execution of application. For the reason of accidentdetection we use run mode of operation. When an coincidence happens, disturbance is created in MEMS which shows atrade in an angle of X-Co-Ordinate offers an analog signal output. This analog signal is transformed into virtual signby means of the usage of internal ADC of and as a result the digital sign is given to ARM processor. We employ three pins of MEMSparticularly X-Co-Ordinate pin(1),examine pin(2),write pin(three). X-Co-Ordinate pin is used for the indication of trade in angle;examine pin offers the statistics or records to the ARM processor.When an ARM processor reads the signal from MEMS its how that an accident has been came about .A good way to discover the spot of coincidence we use ultrasonic sensor, output of ultrasonic is given to microcontroller. At the identical time the onesvalues are displayed on LCD Display. Immediately after the coincidence detection, the air bag is released. Release of airbag is proven in our venture by using sparkling LED. Hence via the usage of MEMS, ultrasonic accident place is detected andthe facts is sent to the cellular in addition to LCD Display.The scope of this paintings is likewise to broaden a safety car braking gadget using ultrasonic sensor (Fig.1) and to layout avehicle with much less human interest to the using. The ultrasonic transmitter has a piezoelectric crystal that resonates upto a required frequency. This also converts the electrical electricity into acoustic electricity and vice versa. While transmitting.

VII. RESULT

The entire prototype as evolved become tested on distinct voltages and special areas. It provided the correct end result at voltage of 230v to440v.We've tested circuit in "**ARM 7 Based Controller Area Network for Accident Avoidance in Automobiles the use of MEMS**", Total strength ate up through save before installation of device is 22KW in month. But after set up of computerized mild control device it decreased to 18.26 KW (power consumption).



VIII. CONCLUSION

With our machine, a secure journey is viable which would decrease the injuries for the duration of injuries and additionally reduce the twist of fate rate due to drunken using. This device has also accident prevention technology which might reduce the twist of fate of the automobile in crowd areas. This automobile coincidence prevention, detection and alert structures provide emergency response with important records at the earliest possible time. Reducing the time between while an coincidence takes location and whilst it's far detected can reduce mortality rates. In future we can interface distinctive sensors with this work, which includes drowsiness detector, coronary heart charge detector, etc. In terms of these we are able to in reality save you accident and shop existence. Security sensors to identify theft also can be brought. It can be reprogrammed to switch off car

and music the car in robbery. Safety car braking device generation might be further stronger and equal can be carried out in aircrafts, submarines.

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