

Advanced Driver Assistance Systems for Pedestrian Crossing Detection

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Abstract- The pedestrian crossing has been the major purpose behind the person on foot and vehicle crashes during nights as well as in highways, this project is focused on identifying the obstacle crossing for supporting an advanced driver assistance system utilizing an IR sensor mounted on the vehicle. In this paper, a particular issue is addressed, which can hugely affect person's lives. To be particular, the discovery of sudden walker intersection to help drivers in maintaining a strategic distance from mishaps. This is mainly concentrated on the Indian sedan cars and their safety with affordable price & device that can be installed in all type of cars. IR sensors are used for the detection of pedestrian crossing which plays a vital role in paper proposed. In case of rash driving on unbalanced roads, the speed of the motor gets dropped down by the accelerometer. When the driver is drunk he will not be able to drive the vehicle when the alcohol content exceeds the limit which stops the engine further. Buzzer used here gives the alert in all kinds of this situation so that can drive the vehicles harmlessly on roads. Here car reduces its speed automatically when it detects the object passing through the vehicle even when the driver is in absent mood or uncontrollable condition. When the vehicle is moving on the steep or sloppy roads, sometimes it might lead to accidents due to the imbalance of the vehicle. This kind of consequences is also handled and overcome. Hence avoids accidents.

Keywords- Literature review, project methodology, components required, conclusion, future enhancement references.

rapid, Disadvantage is that there is a need to improve classification accuracy.

I. INTRODUCTION

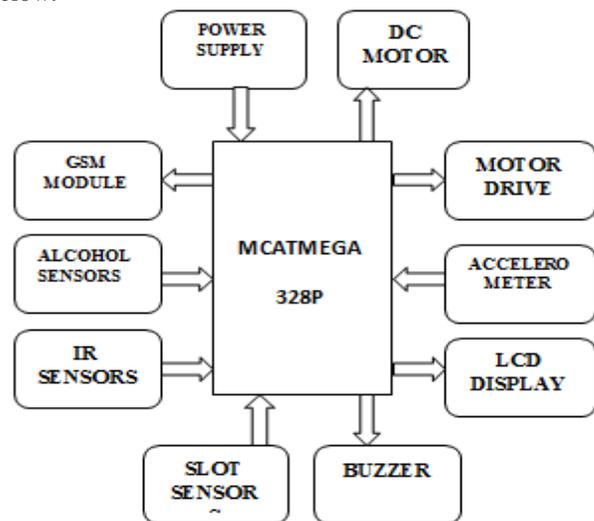
In this paper, a particular issue is addressed that can hugely affect person's lives, to be particular, the discovery of intersection to help drivers in maintaining a strategic distance from mishaps our work is energized by two operators. One is that the proposed issue has mind blowing social noteworthiness and the other is application. Regard Person on foot-vehicle accidents that occurs are an important social issue far and wide. Advanced Driver Assistance Systems that are outfitted with sensors have been planned to sense the obstacles passing in front of the vehicles.

II. LITERATURE REVIEW

Broggi, Fedriga & tagliati (Korea) Proposed pedestrian detection on a moving vehicle investigation about NIR (near infrared) in 2013 which firstly improves luminous areas by the sensors only during summer nights. Car rash driving is detected by sending message to nearest RTO is an oldest method proposed. "Detection of SPC's for driving assistance systems"; they proposed a two-level coarse-to-fine Sense that perceives in part obvious individuals by walking similarly as they enter region, With low false ready rate and

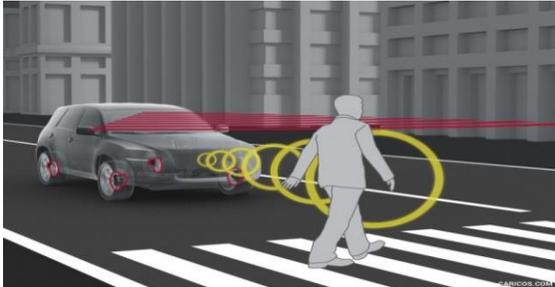
III. PROPOSED SYSTEM

The general perspective of the walker recognition framework which has been proposed is shown in fig.1 below.



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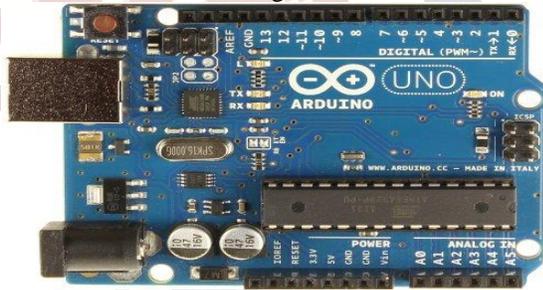
Pedestrian tracking is done to determine the pedestrian correspondences between FIR-NIR sensors. In order to real-time track moving pedestrian, our approach works in two stages: prediction step and matching step. The prediction step is to determine the search area in which the pedestrian might be detected either in far infrared or near infrared sensors search window, matching step is to detect the seriousness of the obstacle where sensors can detect the object which is above 40cm.



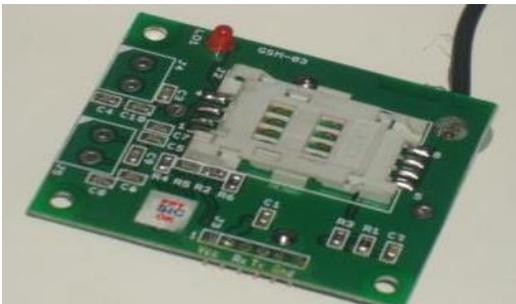
IV. MODEL COMPONENTS

1.1 MCATMEGA328P:High

MCATMEGA328P:High Performance, Low Power AVR@ 8-Bit Microcontroller 131 Powerful Instructions Most Single Clock Cycle Execution On-chip 2-cycle Multiplier Optional Boot Code Section with Independent Lock Bits. Real Time Counter with Separate Oscillator Interrupt and Wake-up on Pin Change. Temperature Range: -40°C to 85°C Speed Grade: 0-20 MHz @ 1.8 - 5.5V Low Power Consumption at 1MHz, 1.8V, 25°C for AT mega48PA/88PA/168PA/328P.



1.2 GSM MODULE

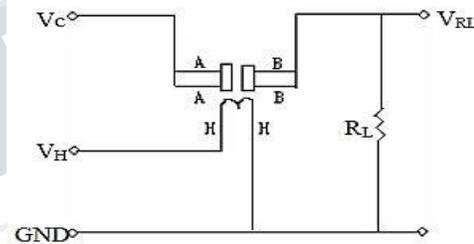


The working of GSM modem is based on commands, the commands always start with AT (which means Attention) and finish with a <CR> character. For example, the dialing command is ATD<number>; ATD3314629080; here the dialing command ends with semicolon. The AT commands are given to the GSM modem with the help of PC or controller. The GSM modem is serially interfaced with the controller with the help of MAX 232.

FEATURES OF SIM 300 MODULE TTL - AT COMMANDS: Designed for global market, SIM300 is a Dual-band GSM/GPRS engine Works on frequencies EGSM 900 MHz, DCS 1800 MHz SIM300 features GPRS multi-slot class 10/ class 8 and supports the GPRS coding schemes.

FEATURES OF GSM KIT: This GSM modem is a highly flexible plug and play dual band GSM modem, which supports features like Voice, Data/Fax, SMS, GPRS and integrated TCP/IP stack. GSM Control via AT commands (GSM 07.07, 07.05 and enhanced AT commands). GSM Uses DC Power supply of 3.6 - 4.6 Volts max.

1.3 ALCOHOL SENSORS



The above is basic test circuit of the sensor. The sensor needs to be put two voltages VC, VH where VH are used to supply certified working temperature to the sensor, while VC used to detect voltage (VRL) on load resistance (RL) whom is in series with sensor. The sensor has light polarity, VC need DC power supply. Where VC and VH could use same power circuit with precondition to assure performance of sensor.

1.4 ACCELEROMETER SENSORS



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Accelometer is a 3 Axis Acceleration Sensor Board based on ADXL3XX from Analog devices. It is a first generation 3 axis acceleration sensor. User could get acceleration value of X, Y, and Z axis. And it is widely used in shock, slope, and moving detection. Output sensitivity could be select by simply set voltage level on few pins. The output of MMA7260Q is analog mode, so you need an A/D converter to read the acceleration value.

FEATURES

The features are 3-axis sensing, low profile package 4mm × 4mm × 1.45mm, Low power supply of 350A (typical). Single-Supply operation of 1.8 V to 3.6 Vand 10,000 g shock survival excellent temperature stability, which is adjusted with a single capacitor per axis. It has RoHS/WEEE lead-free compliant. Specification of Input Voltage is 3.3v and Output is Analog data.

Application:

Tilt-sensing applications, Mobile devices, Gamingsystems, Disk drive protection, Image stabilization.

1.5 SLOT SENSORS



infrared light source, Not sensitive to ambient light, High switching frequency Robust and insensitive to ambient interference ,Tolerantto supply voltage variations up to 60 V DC. Sensing range 0-24mm, infrared 950 nm, and fork width 24mm.

1.6 BUZZER

A buzzer or beeper is an audio signaling device, which may be mechanical, electromechanical, or piezoelectric. Typical uses of buzzers and beepers include alarm devices, timers and confirmation of user input such as a mouse click or keystroke.



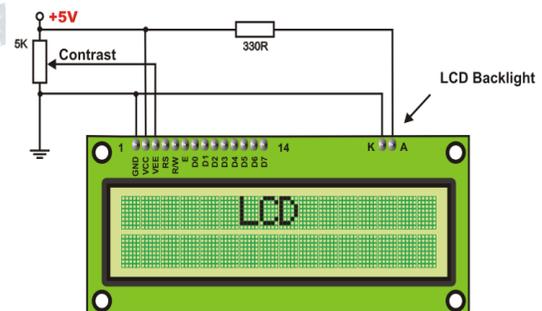
Piezoelectric buzzer

A piezoelectric element may be driven by an oscillating electronic circuit or other audio signal source, driven with a piezoelectric audio amplifier. Sounds commonly used to indicate that a button has been pressed are a click. A piezoelectric element may be driven by an oscillating electronic circuit or other audio signal source, driven with a piezoelectric audio amplifier. Uses: Microwave ovens and other household appliances Electrical alarms, sensing alarms.

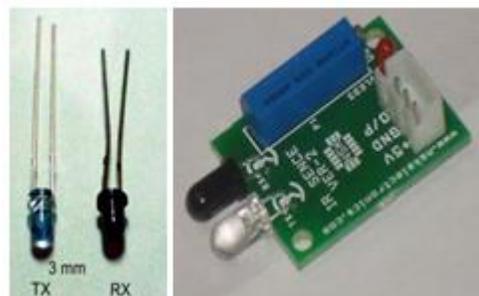
1.7 LIQUID CRYSTAL DISPLAY:

LCD stands for Liquid Crystal Display. LCD is finding wide spread use replacing LEDs (seven segment LEDs or other multi segment LEDs) because of the following reasons: The declining prices of LCDs.

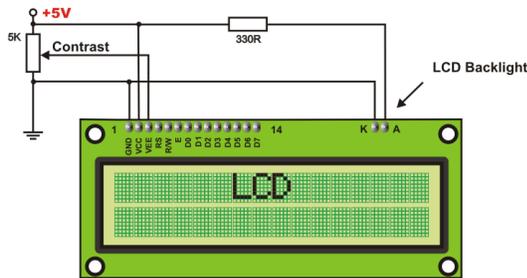
1. The ability to display numbers, characters and graphics. This is in contrast to LEDs, which are limited to numbers and a few characters.
2. Incorporation of a refreshing controller into the LCD,
3. Ease of programming for characters and graphics. These components are "specialized" for being used with the microcontrollers, which means that they cannot be activated by standard IC circuits. They are used for writing different messages on a miniature LCD. It is based on the HD44780 microcontroller (Hitachi) and can display messages in two lines with 16 characters each. It displays all the alphabets, Greek letters, punctuation marks, mathematical symbols etc. In addition, it is possible to display symbols that user makes up on its own. Automatic shifting message on display (shift left and right), appearance of the pointer, backlight etc. are considered as useful characteristics.



1.8 IR SENSORS



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Infrared LEDs are used as a source of infrared rays. It comes in two packages 3mm or 5mm. 3mm is better as it requires less space. Infrared sensor is nothing but a diode, which is sensitive for infrared radiation. This infrared transmitter and receiver are called as IR TX-RX pair objects. Following snap shows 3mm and 5mm IR pairs. Color of infrared transmitter and receiver is different. However you may come across pairs which appear exactly same or even has opposite colors than shown in above picture and it is not possible to distinguish between TX and RX visually. In case you will have to take help of multimeter to distinguish between them.

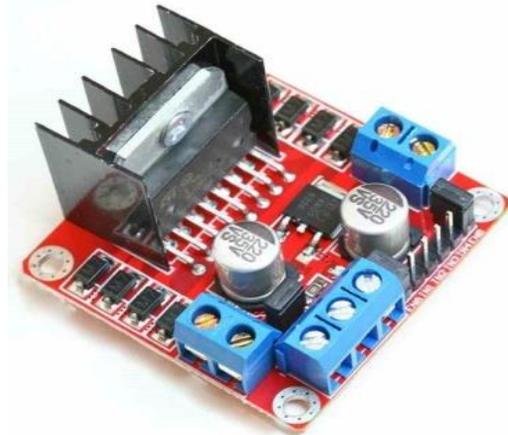
SPECIFICATION: The Operating Voltage is 5v, and Sensitivity up to 6cm, Logic output is either 1/0 with 5v, Applications are line follower Robots Logic output is 10 cm range.

1.9 Motor driver

This Dual Bidirectional Motor Driver is based on very popular L298 Dual H-Bridge motor driver IC. This module will allow you to easily and independently control two motors of up to 2A each in both directions. A motor controller is a device or group of devices that serves to govern in some predetermined performance of an electric motor. A motor controller might include a manual or automatic means for starting and stopping the motor, selecting forward or reverse rotation, selecting and regulating the speed, regulating or limiting the torque, and protecting against overloads and faults.

Applications

Every electric motor has to have some sort of controller. The motor controller will have differing features and complexity depending on the task that the motor will be performing. The simplest case is a switch to connect a motor to a power source, such as in small appliances or power tools. The switch may be manually operated or may be a relay or contactor connected to some form of sensor to automatically start and stop the motor. The switch may have several positions to select different connections of the motor. This may allow reduced-voltage starting of the motor, reversing control or selection of multiple speeds.



1.10 POWER SUPPLY

A device which converts unregulated AC into a constant DC with the help of rectifiers is termed as power supply. A 5v supply has 4 parts: transformer, rectifier, smoothing, and regulator. Dual supplies are used where both +ve & -ve outputs are as and 0v where these have 3 outputs e.g.: -12v, 0v, +12v. Transformer used in this will step down high voltage AC main to low voltage AC. Rectifier converts AC to DC but the DC output is varying. Smoothing smooths the DC from varying greatly to a small ripple. Regulator eliminates the ripple by setting DC output to a fixed voltage.

1.11 DC MOTOR

DC motor mainly works based on the operation of simple electromagnetism. The following circuits control all the DC motor: The 4N25 is an optocoupler, which provides isolation to the microcontroller from the high voltage circuit. ULN2008 is a Darlington coupler IC which provides the required quantity of current for the relay. Motor gets turned on using a 12V relay which is the 3rd component. The same circuit is used for changing the direction of the DC motor.



V. CONCLUSION

The pedestrian passing can be detected within a second of approximately 0.3s. Vehicle speed can be controlled by using an accelerometer in the steepy roads. Alcohol can be

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sensed when driver consumes it more than the limit set. Message alerts can be given using GSM module to the authenticated number which is registered in the gsm kit. It enhances safety of the driver and pedestrian by reducing risk of accidents. Speed of the vehicle is reduced instead of stopping of the engine during crossing of pedestrians mainly on Indian roads.

VI. FUTURE ENHANCEMENT

It can be implemented as vehicle to another vehicle communication by enhancing the link between drivers. Automatic honking system can be introduced. Voice message alerts instead of buzzer can be implemented. Advanced braking systems can be used.

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