Vehicle Tracking System based on Artificial Intelligence and Networking

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Abstract: The main purpose behind this project is "Drunk driving detection". Now a days, many accidents are happening because of the alcohol consumption of the driver or the person who is driving the vehicle. Thus, Drunk driving is a major reason of accidents in almost all the countries in the world. Alcohol Detector in Car project is designed for the safety of the people seating inside the car. This project should be fitted / installed inside the vehicle. Now a day's GPS tracking system is widely used all over in the words.

I.   INTRODUCTION

 In this paper we will show the system requirement for tracking the location and describe the implementation feature. To implement such system a GPS with high accuracy is required. In this system we send the message name TRACK to the device and the GPS of that device send the longitude and latitude to the GSM module , GSM module receive the information about longitude and latitude of that car location , further this message will be send to the user for tracking the location of car .This paper provides the concept for developing a low cost, high accuracy and user friendly system by using Google map. Improvements are proved by Google map that make high accuracy.

II.   SYSTEM DESIGN AND IMPLEMENTATION

A.   System Implementation

In this Chapter we are going to explain about the system design construction through Hardware and development of software. In addition, the chapter elaborates the hardware and the software stage by stage. All the operations of hardware and software are also included in this chapter. The system design of the total project is shown in below figure with simple block diagram. The sensor basically will be the input that will trigger the Arduino to control certain condition of the program. The Arduino is set to decide how the outputs will be produced and will be displayed at the display part. As the system requires the use of Arduino, the design consists of two parts, hardware and software. Hardware is constructed and integrated module by module, hardware to software for easy troubleshooting and testing.
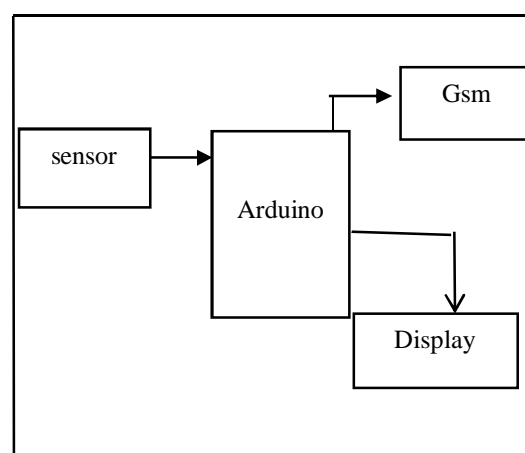
Block Diagram 1 : Simple System Design

III. SYSTEM ARCHITECTURE

The system architecture of the auto matic output appliance can be divided into different Modules. They are:

1) Arduino Module
2) Sensory Module
3) Liquid Crystal Display (LCD) Module
4) Buzzer
5) GSM module
6) GPS module

The integration of the modules are producing the system which is more or less can be divided into two phase here the first phase is the output smart Appliance system and the second phase is the monitoring system. Figure 3.2 shows the separated phase through the boxes. The Arduino, sensory and Appliance modules are in the first phase of the system and LCD Module is in the second phase monitoring system.

A. Arduino

It is an open source, computer hardware and software company, project, and user community that designs and manufactures single-board microcontrollers and microcontroller kits for building digital devices and interactive objects that can sense and control objects in the physical world. The Arduino is a simple yet sophisticated device which is based on Atmel's ATmega microcontrollers. The boards feature serial communications interfaces, including Universal Serial Bus (USB) on some models, which are also used for loading programs from personal computers. The microcontrollers are typically programmed using a dialect of features from the programming languages Cand C++. In addition to using the Arduino project provides an integrated development environment (IDE) based on the Processing language project.

IV. ARDUINO UNO BOARD

Arduino UNO is one of the microcontroller boards manufactured by the Arduino and it is a microcontroller board based on Atmel's ATmega328P microcontroller. "UNO" means one in Italian and the UNO board is the latest in a series of USB (Universal Serial Bus) Arduino boards which is the reference model for the Arduino platform. The Arduino UNO board has a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header, a reset button, 6 analog inputs and 14 digital input/output pins (of which 6 can be used as PWM outputs). It uses theAtmega16U2 programmer as a USB-to-serial converter instead of FTDI USB-to-serial driver chip which was used in all the pre-ceding boards. The board has 32 KB flash memory of which0.5 KB is used by boot-loader, 2 KB of SRAM, 1 KB of EEPROM and 16 MHz clock speed.
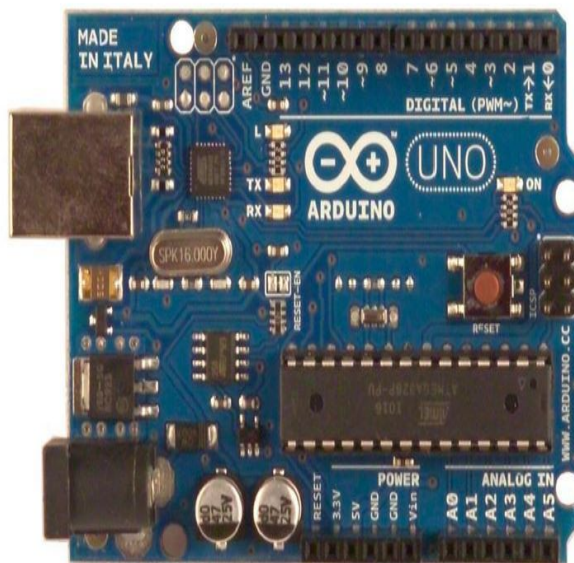

Figure 1: ArduinoUNO

A.   Liquid Crystal Display

LCD is as well another output appliance here. It is used to display character in the ASCII code form which is mean the data for character that been sent by the controller to the LCD should be in 8-bit ASCII representation. The system is using the LCD to preview the safe zones as well as which of them are on fire. In the project we have used A LCD Display (16x2) and the model Number is LM016L. Normally available LCD in the market for normal displays in the projects is 2x16 pin LCD which is easily available. Talking about its specifications it has got 8 data pins, 3 control pins, and rest 5 pins for GND and VCC connections. Another LCD being used is 2x8 pin LCD but it was costly and has got better display but compromising on price and display helps to fulfill this job in a cheaper way. So 2x16 LCD is being used in the project. Its display and light intensity is also adjustable which makes it suitable to adjust for the day and night time use for better display.
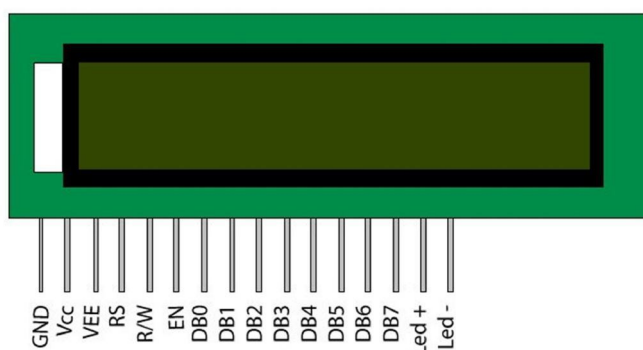

Figure 2 :LCD Display

B.   2rows X 16 Columns Text LCD

In this project we used 2rows x 16 columns text LCD consist of two lines by 16 characters and provides basic text wrapping so that your text looks right on the display. The LCD display is compatible with the C stamp microcomputers supplies and signal levels. The LCD we are using have 16 pins out of which 4 pins are directly going to Arduino pin number 2 to 5.

Pin No.	Function	Name
1	Ground (0V)	Ground
2	Supply voltage 5V (4.7V – 5.3V)	Vcc
3	Contrast adjustment; through a variable resistor	VEE
4	Selects command register when low; and data register when high	Register Select
5	Low to write to the register; High to read from the register	Read/wri te
6	Sends data to data pins when a high to low pulse is given	Enable
7		DB0
8		DB1
9	8-bit	DB2
10	Data pins	DB3
11		DB4
12		DB5
13		DB6
14		DB7
15	Back light Vcc (5V)	Led+
16	Back light ground (0V)	Led-

Table 1:Pin Description of 16X2 LCD Display

Two pins are connected with Vcc one with ground and one with the potentiometer to set the resolution of LCD.Three control pins of LCD are also connected to Arduino. They are used for enabling LCD, performing read or write operations and to select command or data register.
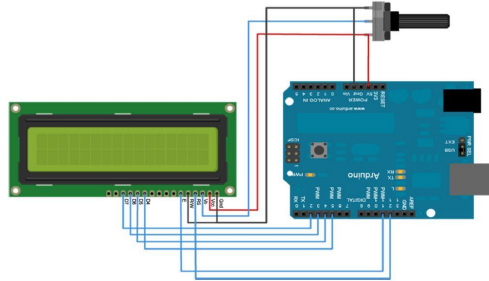

Figure 3:LCD Interfacing with Arduino

C. *Smoke Sensor*

One of the main characteristics of fire is the smoke. Thus smoke sensors can play a vital role in detecting fire in the forest. We have used MQ-4 sensor for detecting smoke depending upon its availability and cost. MQ-4 gas sensor has high sensitivity to LPG, Propane and Hydrogen, also could be used to Methane and other combustible steam, it is with low cost and
of MQ-4 gas sensor is SnO_2, which with lower conductivity in clean air. When the target combustible gas exist, the sensor's conductivity is higher along with the gas concentration rising.



Figure 4:MQ-4 Sensor

D. *GSM Module*

Figure 5: GSM module

The research paper of 2016 child has been tracked but system is complex due to use of ARM controller . And in 2013 the paper GPS and GSM child tracking system using smart phone, But it is not necessary to child have the with him. Now, we design Arduino based child tracking system using GPS and GSM which is economical. There are various researches in improving the accuracy of GPS point . Now we can simply find the child location by using the Google Map. Google Map Web mapping service developed by Jens Eilstrup Rasmussen. It provides turn by turn navigation alongdedicated parking assistance feature. It is primarily available on the mobile

V. VEHICLE TRACKING SYSTEM

Circuit Connections of this Vehicle Tracking System Project is simple. Here Tx pin of GPS module is directly connected to digital pin number 10 of Arduino. By using Software Serial Library here, we have allowed serial communication on pin 10 and 11, and made them Rx and Tx respectively and left the Rx pin of GPS Module open. By default Pin 0 and 1 of Arduino are used for serial communication but by using Software Serial library, we can allow serial communication on other digital pins of the Arduino. 12 Volt supply is used to power the GPS Module. GSM module"s Tx and Rx pins of are directly connected to pin Rx and Tx of Arduino. GSM module is also powered by 12v supply. An optional LCD"s data pins D4, D5, D6 and D7 are connected to pin number 5, 4, 3, and 2 of Arduino. Command pin RS and EN of LCD are connected with pin number 2 and 3 of Arduino and RW pin is directly connected with ground. Potentiometer is also used for setting contrast or brightness of LCD.
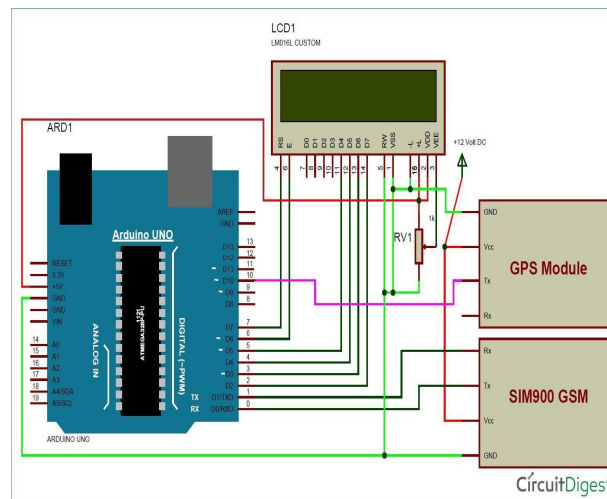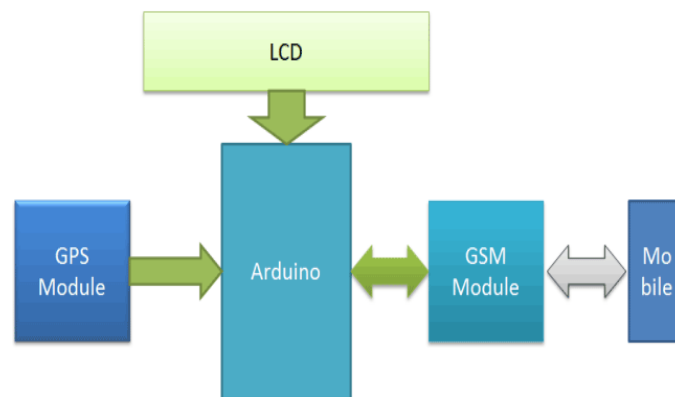

Block Digram 2: Vehicle Tracking System

Figure 6: Circuit Diagram of Vehicle Tracking System Project

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