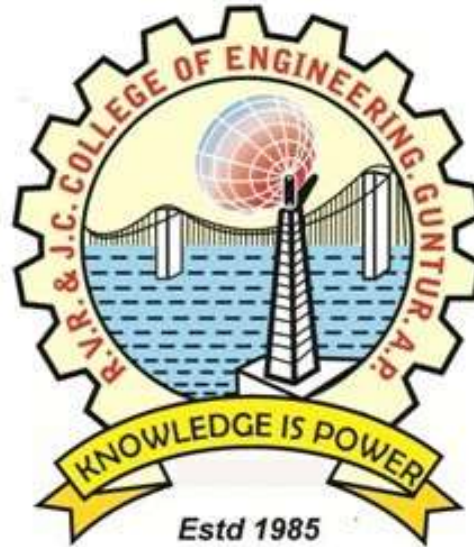


R.V.R. & J.C. College of Engineering


Department Of IT



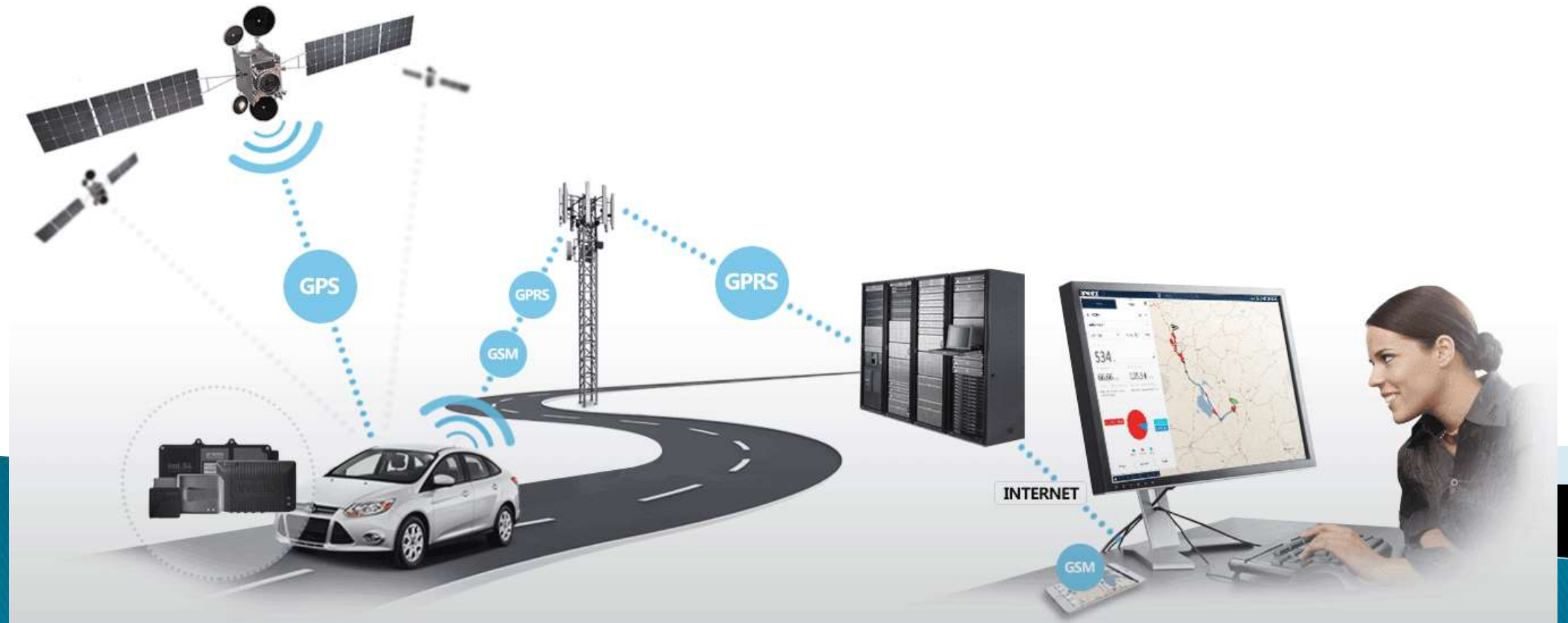
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Table of content

- Problem statement
 - Abstract
 - Introduction
 - Literature Review
 - Architecture of Proposed Method
 - Implementation
 - Results & Discussions
 - Conclusion
 - References
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ADVANCED VEHICLE SECURITY SYSTEM



PROBLEM STATEMENT

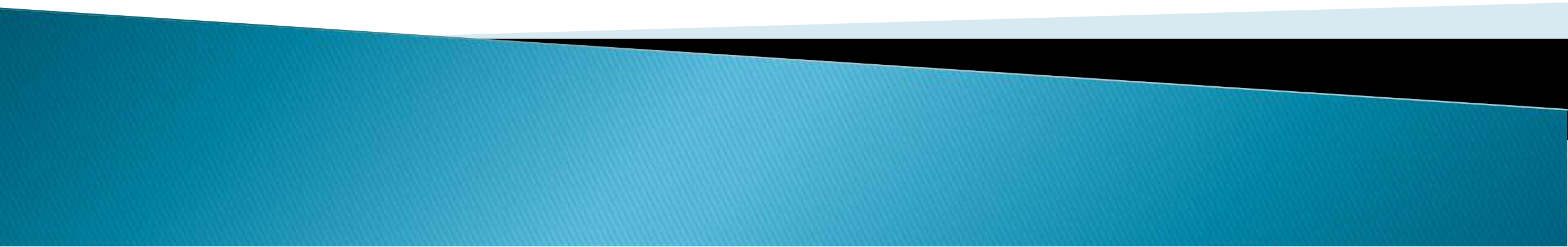
- In this modern era as there is raise in technology as we know with power comes with great responsibilities ,technology also bought great concerns about security of vehicles so in order to resolve this issue we are in quest to design a good anti-theft system namely we call it as advanced vehicle security system.
 - The first issue we can face in common is the theft of vehicle so we using a combination of two great systems which is already proven to be effective and promising.
 - We combining the vehicle tracking system with another system by which we can control the vehicle even after its been theft before it gets out of reach of the owner.
- 

ABSTRACT


- Security, especially theft security of vehicle in common parking places has become a matter of concern.
- An efficient automotive security system is implemented for anti-theft using an embedded system integrated with Global Positioning System (GPS) and Global System for Mobile Communication (GSM).
- This proposed work is an attempt to design and develop a smart antitheft system that uses GPS and GSM system to prevent theft and to determine the exact location of vehicle.
- In the designed system we can easily communicate with our vehicle from anywhere with the help of GSM and we can command our vehicle according to our need via message to avoid stealing of our vehicle.

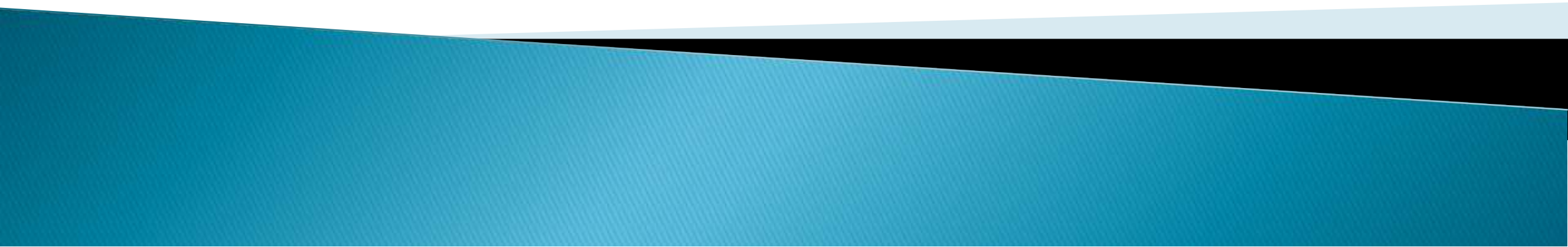



INTRODUCTION

- Now a day's every system is automated in order to face new challenges. In the present days automated systems have less manual operations, flexibility, reliability and accurate. Due to this demand every field prefers automated control systems. Especially in the field of electronics automated systems are giving good performance.
 - We provide security to the vehicles i.e. we provide the locking and unlocking system to the vehicles by using GSM technology
 - Here we can provide security to the vehicle access by adding a password at the starting of the message if entered password is correct send OTP to registered mobile number password and OTP is correct Ignition relay ON otherwise OFF vehicle In other case vehicle theft send live location connected through Google maps.
 - These day's vehicle robbery cases are higher than any other time, it has gotten to be fundamental to give a vehicle a superb security with the main solid hostile to burglary gadget. Vehicle focal locking framework guarantees the best ensure to secure your vehicle from various types of burglary cases.
- 


Literature

- A combined GPS-GSM system is proposed to track vehicles using Google Earth application shown by Mohammad A. AlKhedher et al. [6]. The remote module envelops a GPS attached on the moving vehicle to recognize its blessing position, and to be changed by GSM with entirely unexpected parameters gotten by the auto's information port as a SMS to a recipient station. The got GPS masterminds are filtered using a Kalman channel to update the accuracy of estimated position. After data getting ready, Google Earth application is used to see the present zone and status of each vehicle. This goal of this structure is to direct naval force, police cars transport and vehicle robbery cautions.
 - On real time vehicle monitoring system presented by P.Muruganandham,R.Mukesh for the applications which require ceaseless area information of the car [7]. For getting the autonomous positioning system that can transmit the regional data logically, Active structures are generated. The device is a combination of GPS/GSM module and a SMS feedback system. Main hardware in the car unit is the GPS/GSM module and a remote tracking server.
- 


- It is a vehicle security gadget that offers fantastic insurance to your vehicle. However, this framework couldn't demonstrate to give complete security and openness to the vehicle in the event of burglary.
 - So a more created framework makes utilization of an inserted framework focused around GSM innovation.
 - Combination of high affectability GPS units in vehicle following frameworks has empowered these gadgets to work in different varieties of situations, for example, characteristic ravines, urban gulches and much under substantial foliage, the length of system scope is solid.
 - This vehicle following framework found in client's vehicles as a burglary counteractive action and salvage gadget.
 - Vehicle manager or Police take after the sign emitted by the following framework to place a victimized vehicle in parallel the stolen vehicle motor rate going to diminished and pushed to off.
 - Vehicle following frameworks acknowledged in shopper vehicles as a burglary avoidance and recovery gadget. In the event that the burglary recognized, the framework sends the SMS to the vehicle holder.
 - After that vehicle manager sends the SMS to GSM modem appended to the controller, issue the important signs to stop the robbery.
- 

- A paper on the vehicle hostile to burglary system [8] introduced by Ganesh G.S.P, Balaji B and Varadhan T.A.S combination of several steps of insurance with one supplementing the other, as altered to the regular against robbery system where a specific system is just being utilized. This is one of the simplest vehicle protection system which works only using GSM technology apart from GPS system. The user can turn on and off the vehicle just by a SMS and the vehicles details will be sent to the nearest base station. Though the simple structure, it consumes more time to operate whole operation.
 - A constant automobile monitoring system introduced by Muhammad Adnan Elahi, Yasir Arfat Malkani and Muhammad Fraz, [10] proposed a Real-Time automobile monitoring system which obtains the automobile's area, the engine of the automobiles locked while unauthorized access attempt is found. The gathered data containing automobile location and access time then send to the user's phone. The system have no specific input method.
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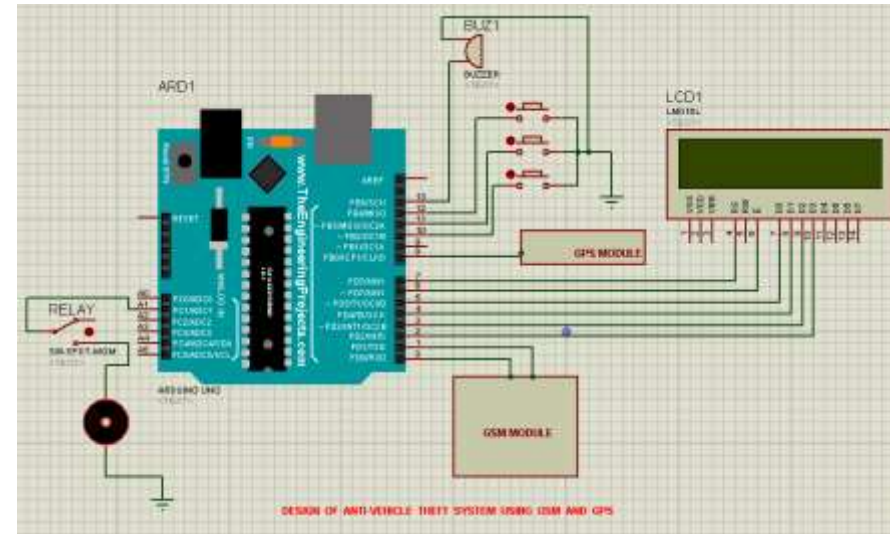
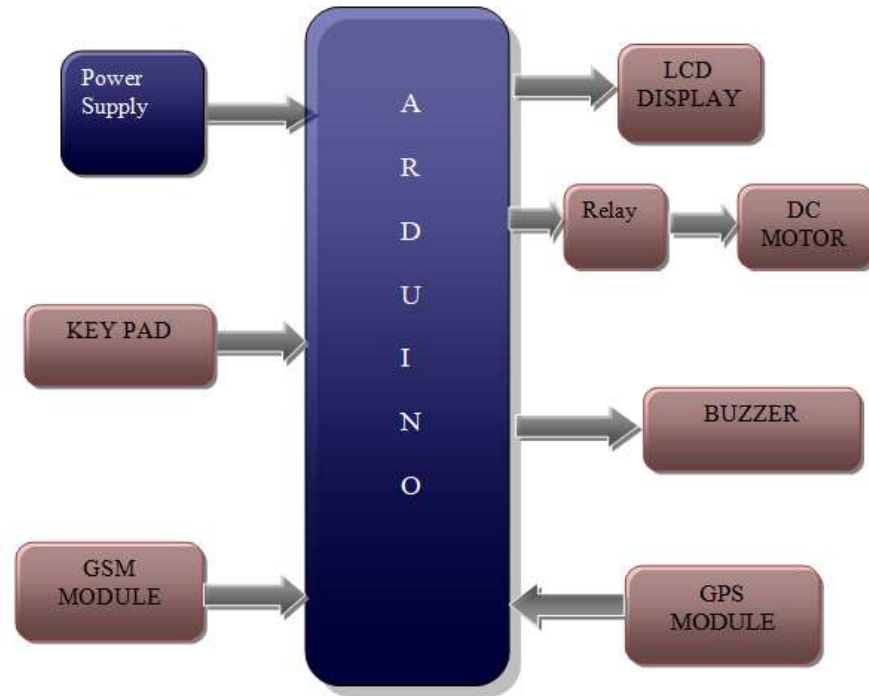
EXISTING SYSTEM

- Today in the current global scenario safety and especially security of vehicle in common parking places has become a prime concern.
 - In this system simple and cheaper vehicle tracking is implemented with the help of Global Positioning System (GPS), and Global System for Mobile Communication (GSM) technologies.
 - The main components in the system are GPS module, GSM modem, RFID reader and microcontroller.
 - The use of GPS system is to track the current location of the vehicle. As GPS system can only receive the vehicle location information from the satellites, GSM system is also installed in the vehicle for sending information to vehicle's owner. In case of towing and break open of vehicle this system automatically sends the SMS to own
- 

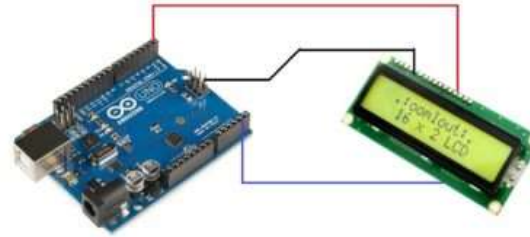
PROPOSED SYSTEM

- ▶ An efficient automotive security system is implemented for anti-theft using an embedded system integrated with Global Positioning System (GPS) and Global System for Mobile Communication (GSM).
 - ▶ This is an attempt to design and develop a smart antitheft system that uses GPS and GSM system to prevent theft and to determine the exact location of vehicle. In the designed system we can easily communicate with our vehicle from anywhere with the help of GSM and we can command our vehicle according to our need via message to avoid stealing of our vehicle.
 - ▶ The existing security system is based on buzzer and is a single password system that can't be easily stolen.
- 

BLOCK DIAGRAM OF SECURITY ARCHITECTURE



LCD DISPLAY



- LCD (Liquid Crystal Display) is a type of flat panel display which uses liquid crystals in its primary form of operation. LCDs have a large and varying set of use cases for consumers and businesses, as they can be commonly found in smartphones, televisions, computer monitors and instrument panels.
- The principle behind the LCDs is that when an electrical current is applied to the liquid crystal molecule, the molecule tends to untwist. This causes the angle of light which is passing through the molecule of the polarized glass and also causes a change in the angle of the top polarizing filter. As a result, a little light is allowed to pass the polarized glass through a particular area of the LCD.
- **16×2 LCD** is named so because; it has 16 Columns and 2 Rows. There are a lot of combinations available like, 8×1, 8×2, 10×2, 16×1, etc. but the most used one is the 16×2 LCD. So, it will have (16×2=32) 32 characters in total and each character will be made of 5×8 Pixel Dots.

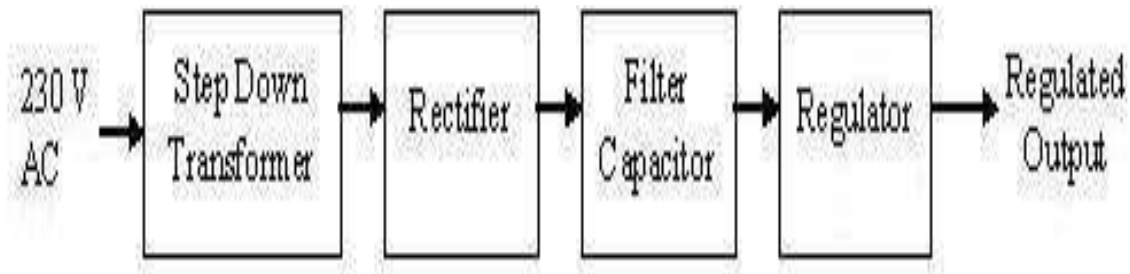
ARDUINO



- Arduino is an open-source 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 both physically and digitally. Its products are licensed under the GNU Lesser General Public License (LGPL) or the GNU General Public License (GPL), permitting the manufacture of Arduino boards and software distribution by anyone.
- Arduino microcontrollers are pre-programmed with a boot loader that simplifies uploading of programs to the on-chip flash memory.
- It is a interface between hardware and software which is used to run applications .

POWER SUPPLY

➤ All digital circuits require regulated power supply. In this article we are going to learn how to get a regulated positive supply from the mains supply.



KEYPAD

- A **keypad** is a set of buttons arranged in a block or "pad" which usually bear digits and other symbols and usually a complete set of alphabetical letters.
- If it mostly contains numbers then it can also be called a **numeric keypad**. Keypads are found on many alphanumeric keyboards and on other devices such as calculators, push-button telephones, combination locks, and digital door locks, which require mainly numeric input.



GPS MODULE



- GPS is known as Global Positioning System used to trace the location of vehicle. A GPS framework computes its position by accurately timing the signal sent by GPS satellites high over the Earth. GPS Receiver gets the location information from satellites.
- It consists of internal RTC back up and can be directly connected to USART of the microcontroller. The current date, time, longitude, altitude, speed, and travel direction/ heading among other data are provide by the module and can be used in many applications including navigation, fleet management, tracking system, mapping.

GSM MODULE

- GSM, which stands for Global System for Mobile communications, reigns (important) as the world's most widely used cell phone technology.
- Cell phones use a cell phone service carrier's GSM network by searching for cell phone towers in the nearby area. Global system for mobile communication (GSM) is a globally accepted standard for digital cellular communication.

GSM – Architecture:

- A GSM network consists of several functional entities whose functions and interfaces are defined. The GSM network can be divided into following broad parts.
 - 1.The Mobile Station (MS)
 - 2.The Base Station Subsystem (BSS)
 - 3.The Network Switching Subsystem (NSS)
 - 4.The Operation Support Subsystem (OSS)

BUZZER:

- Basically, the sound source of a piezoelectric sound component is a piezoelectric diaphragm. A piezoelectric diaphragm consists of a piezoelectric ceramic plate which has electrodes on both sides and a metal plate (brass or stainless steel, etc.).
- A piezoelectric ceramic plate is attached to a metal plate with adhesives. Applying D.C. voltage between electrodes of a piezoelectric diaphragm causes mechanical distortion due to the piezoelectric effect. For a misshaped piezoelectric element, the distortion of the piezoelectric element expands in a radial direction.
- And the piezoelectric diaphragm bends toward the direction. The metal plate bonded to the piezoelectric element does not expand. Conversely, when the piezoelectric element shrinks, the piezoelectric diaphragm bends in the direction. Thus, when AC voltage is applied across electrodes, the bending is repeated, producing sound waves in the air.

➤ If a battery is used as the power supply, it is worth remembering that piezo sounders draw much less current than buzzers. Buzzers also just have one 'tone', whereas a piezo sounder is able to create sounds of many different tones. To switch on buzzer -high 1 ,to switch off buzzer -low 1



RELAY MODULE



- The arduino relay module has total of six pins: three on one side and three on other side.
- On the bottom side, there are three pins which are signal, 5V and ground. We will connect these pins with the arduino. While on the other side, there are NC (Normally close), C (Common) and the NO (normally open) which are the output pins of the 5V relay. There, we will connect the output device.
- In the first part, we will control a led using the relay and in the second part we will control a high voltage device using the relay. Controlling a DC device is easy as compared to the AC device. For controlling the DC device, you do not require an external supply until you are controlling a small voltage device like LED which runs on up to 5V.

Flowchart

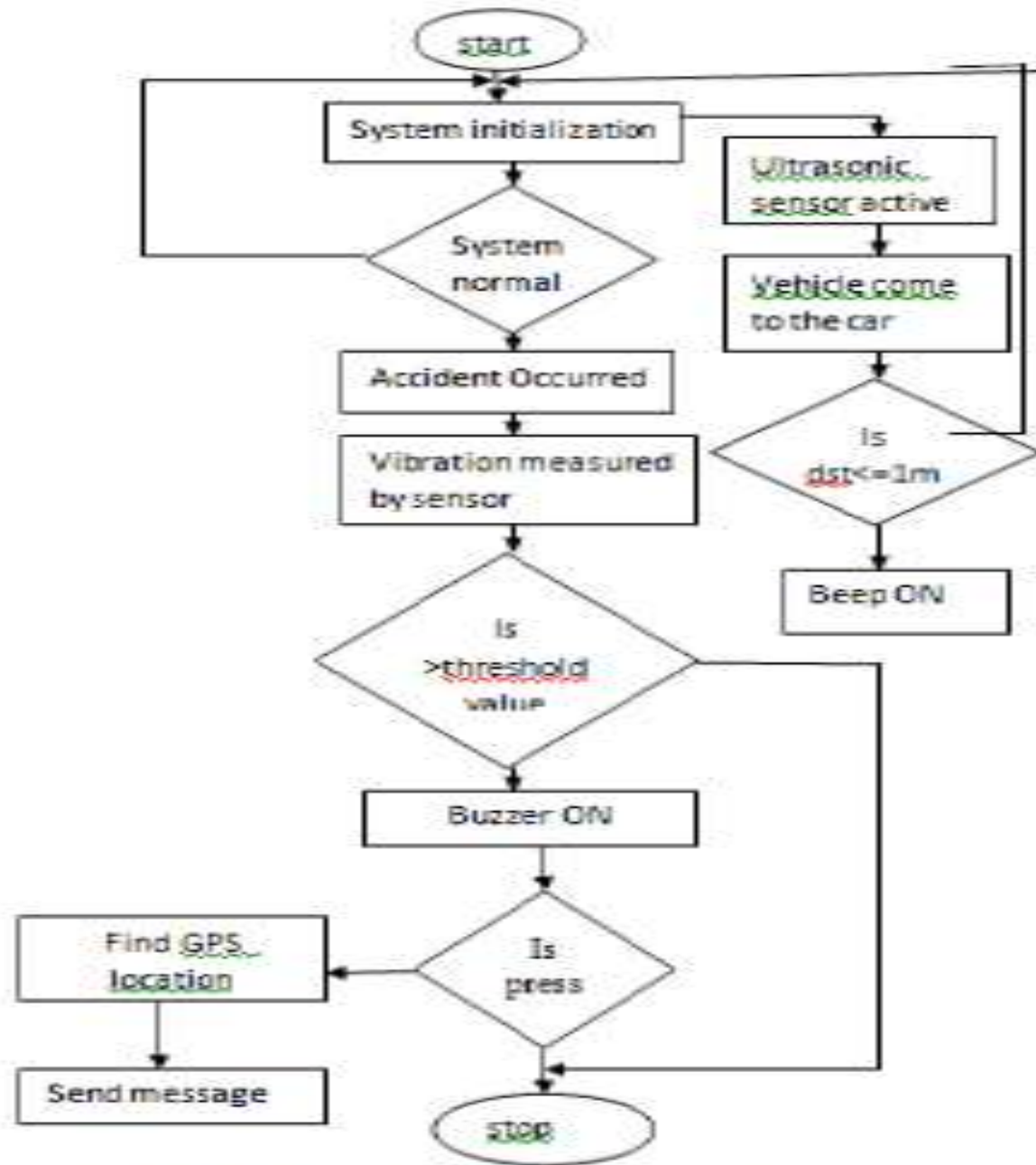


Fig:8. Flow chart to track the accident

STEPS FOR IMPLEMENTATION

Stage 1: begin the procedure

Stage 2: Set counter =3.

Stage 3: Enter code from data input device.

Stage 4: Check code with recently placing away code.

Stage 5: Is it the same? On the off probability that "YES" at that time go to step8.If "NO" at that time go to stage half dozen.

Stage 6: Decrease counter.

Stage 7: Is counter=0? On the off probability that "YES "then educate to police and owner. Forward "NO" at that time Step three.

Stage 8: Send an instant message to the owner for vehicle get to.

Stage 9: Check all parameters of sensing element.

Stage 10: Is any parameter remote? On the off probability that "YES" at that time

head to Step eleven. Forward "NO" the message will not be sending to owner.

Stage 11: Buzzer is "ON".

Stage 12: Check the bell is halted within 1 minute. On the off probability that "YES"

message will not be send to owner. forward "NO" go to Step thirteen.

Stage 13: Send message to station house and owner.

Stage 14: Stop.



RESULT



➤ As we turn ON the system it will show the message “ANTI THEFT SYSTEM FOR VEHICLE SECURITY” as shown in Fig.2. The system in the Beginning takes around 1 minute to set GPS in a working condition and read out all the units which are connected with it.

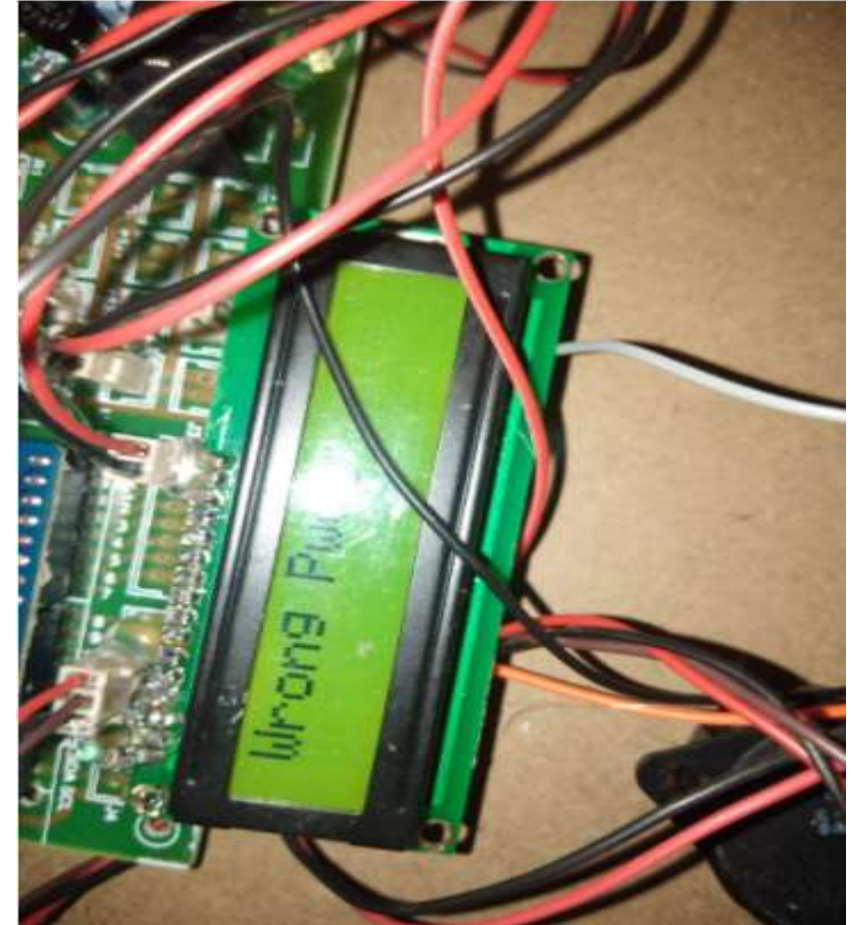
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- ▶ As the GPS comes in working condition it will send OTP to the owner's registered number. Now as the owner enters the received OTP to the system with help of keypad than the system first make the verification of that OTP, if the entered OTP is correct than it will turn ON the ignition system with the help of relay and the shows the message" valid password thanq" . If someone enters the wrong OTP it shows the message "invalid password " and it will send the message "unauthorized person trying to access your vehicle" to the owner's registered number.

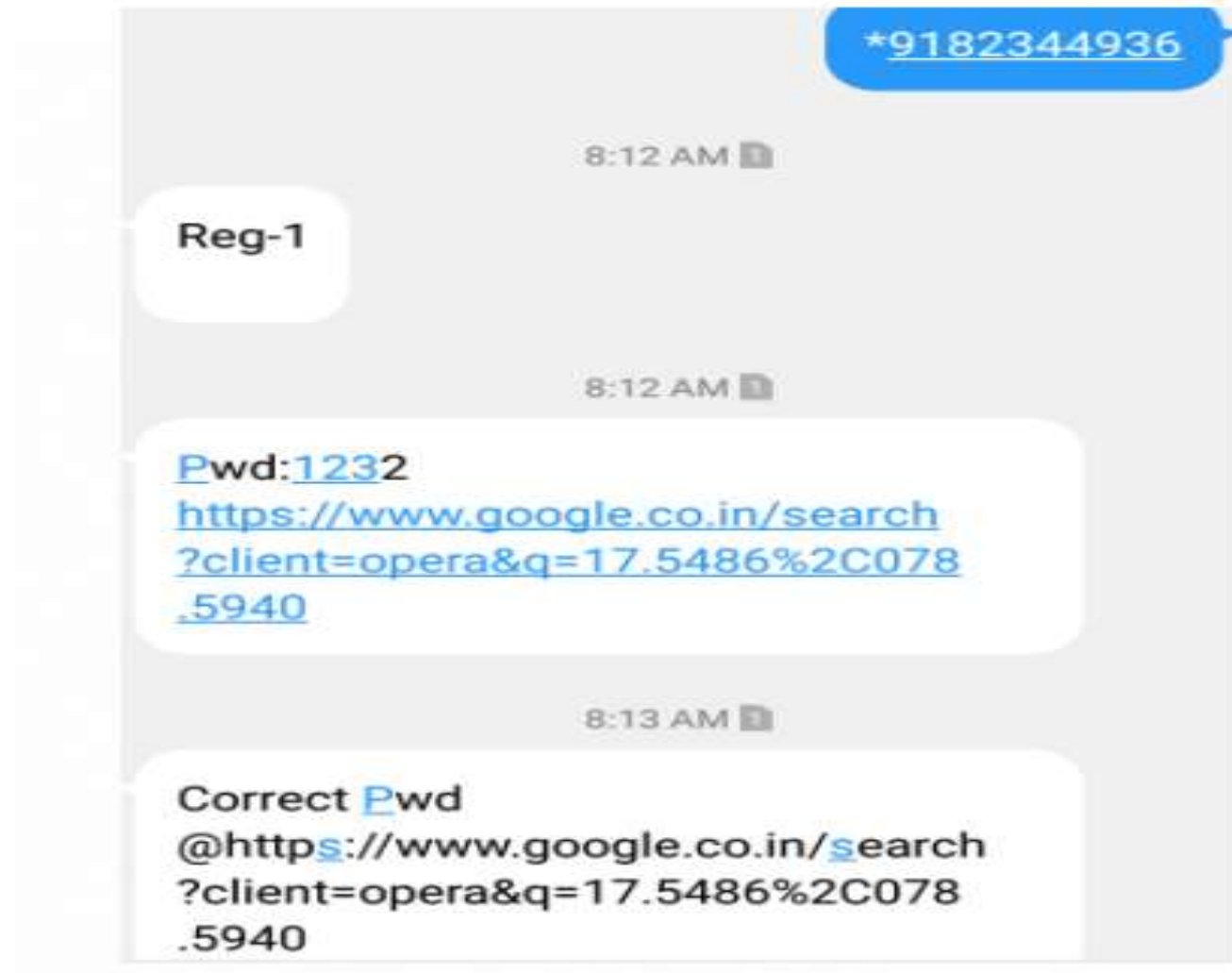
OTP INDICATION



3.Password indication 4.Wrong password



Result



CODE


```
#include <Adafruit_GPS.h>
#include <SoftwareSerial.h>
#include <LiquidCrystal.h>
#define GPSSerial Serial
SoftwareSerial gsm(9, 10); //rx,tx gsm module pins
Adafruit_GPS GPS(&GPSSerial);
#define GPSECHO false
uint32_t timer = millis();
LiquidCrystal lcd(A5, A4, A3, A2, A1, A0); //rs en d4 d5 d6 d7
unsigned int mode_sw = 3, ig_key = 4, sec_key = 5, acc = 6, mot = 13, buz = 7;
unsigned int b,i,chk;
float lat,lon;
//String exString = "0123456789"; // example string
char x;
int o;
String exString;
```



```
void setup()
{
  Serial.begin(9600);
  GPS.begin(9600);
  gsm.begin(9600); // Setting the baud rate of GSM Module
  GPS.sendCommand(PMTK_SET_NMEA_OUTPUT_RMCGGA);
  GPS.sendCommand(PMTK_SET_NMEA_UPDATE_1HZ); // 1 Hz update rate
  GPS.sendCommand(PGCMD_ANTENNA);
  //Serial.println("Adafruit GPS library basic test!");
  pinMode(ig_key,INPUT);
  pinMode(sec_key,INPUT);
  pinMode(acc,INPUT);
  pinMode(mot,OUTPUT);
  pinMode(buz,OUTPUT);
  digitalWrite(mot,LOW);
  beep(4);
  lcd.begin(16, 2);
  lcd.setCursor(0,0);
  lcd.print("ACC,THEFT,TRACK.");
  lcd.setCursor(0,1);
  lcd.print("DETECTION SYSTEM");
  delay(500);
  RecieveMessage();
}
```

▸

```
void loop()
{
chk='2';
while(chk=='2')
{
digitalWrite(buz,LOW);
lcd.setCursor(0,0);
lcd.print("  WAITING FOR  ");
lcd.setCursor(0,1);
lcd.print("  IGNITION KEY  ");
//Serial.println(analogRead(A0));
if(digitalRead(ig_key)==0)
{
chk='0';
for(i=0;i<15;i++)
{
if(digitalRead(sec_key)==0)
{
chk='1';
goto out;
} delay(15); beep(1);
}
}
```



CONCLUSION

➤Our project is particularly use to safeguard the vehicles. We can easily communicate with our vehicle from anywhere with the help of GSM and The password generated is random so it can't be stolen by another person.The project is totally based on otp. Finally we can say that a fully secured system for a vehicle has been designed by us and all the objectives taken has been fulfilled successfully.

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THANK YOU