

Robust Cruise Controlling & Crash Evasion System

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Abstract –

This research paper represents Robust Cruise Control (RCC) and Crash Evasion (CE) device for wagon self-driving. The mechanism arrangement is intended to increase drivers luxury coziness throughout number of driving circumstances and to entirely evade collide crash evasion by simple decelerating and lane alteration movement. In demand to generate such an use, the anticipated device contains of an end long device policy for multi-vehicle RCC with simple decelerating, a cross device policy for lane alteration, and a conclusion unit for assimilation of two policies. The end long device policy was used to accomplish coziness performance of subject wagon in usual driving circumstances and to accomplish safe performance in sever-braking circumstances. The adjacent device policy is used to produce a route for lane alteration and track the produced route in imperative to evade crash.

Keywords— Include at least 4 keywords or phrases

I. INTRODUCTION

Automobiles and computing technologies are creating a new level of data services in vehicles. The automobile black box has functions similar to an airplane black box. It is used to analyse the cause of vehicular accidents and prevent the loss of life and property arising from vehicle accidents.

The system aims to achieve **accident analysis** by objectively tracking what occurs in vehicles. The system also involves enhancement of security by preventing tampering of the black box data. In addition, the black box sends an alert message to a pre-stored mobile number via short message service (SMS) in the case of occurrence of an accident.

The proposed system makes use of 5 sensors to record the various driving data parameters. **Arduino** controller is used to regulate these sensors. The data received from the sensors are stored on the **thingspeak** and the can be data retrieval after the accident. The system uses external sensors such as

camera and global positioning system (GPS) to collect video and location data.

Apart from the accident analysis by objectively tracking what occurs in vehicles, the proposed system sends short message indicating the position of vehicle by gps system to family member, **emergency medical service (ems)** and nearest hospital so that first aid can be provided as early as possible. It may also adapt speed “**cruise control**” by using ultrasonic sensors data in rear and front.

II. AIM OF PROJECT

The aim of the device **Robust Cruise Control (RCC) and Crash Evasion (CE)** is to attain **accident analysis** by objectively tracking what occurs in vehicles. The mechanism arrangement is intended to increase drivers luxury coziness throughout number of driving circumstances and to entirely evade collide crash evasion by simple decelerating and lane alteration movement. The system also involves enhancement of security by preventing tampering of the black box data. In demand to generate such an use, the anticipated device contains of an end long device policy for multi-vehicle RCC with simple decelerating, a cross device policy for lane alteration, and a conclusion unit for assimilation of two policies. The end long device policy was used to accomplish coziness performance of subject wagon in usual driving circumstances and to accomplish safe performance in sever-braking circumstances.

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III. WHAT WE ARE PLANNING TO DO

- A METHOD OF SETTING DESIRED DISTANCE
- A BUTTON TO CONFIRM NEW SETTINGS
- COLLISION WARNING
- CANCEL SETTING / EXIT ACC
- LCD DISPLAY MODE AND SET DISTANCE AND ACTUAL DISTANCE
- ENGINE ACCELERATION (PWM OUTPUT TO LED)
- BRAKE CONTROL (PWM OUTPUT TO LED).
- MEANINGFUL DATA FROM THE SYSTEM EXPORTED TO USB VIA A .CSV FILE AND PROCESSED IN EXCEL.
- SEVEN SEGMENT DISPLAY TO SHOW CHANGING GEAR IN A CAR AS THE CRUISE CONTROL TAKES OVER.

IV. COMPONENTS & SENSORS USED IN PROJECT

- A. **ULTRASONIC SENSOR HC-SR04**
- B. **GSM 800A MODULE**
- C. **GPS MODULE**
- D. **HC-05 BLUETOOTH MODULE**
- E. **ARDUINO**
- F. **H-BRIDGE MOTOR DRIVER**
- G. **12 Volt Battery**
- H. **Alcohol Sensor**
- I. **DHT-11 Sensor**
- J. **Accelerometer**

A. **ULTRASONIC SENSOR HC-SR04**

Ultrasonic ranging module HC - SR04 provides 2cm - 400cm non-contact measurement function,

the ranging accuracy can reach to 3mm. The modules includes ultrasonic transmitters, receiver and control circuit. The basic principle of work:

1. **Using IO trigger for at least 10us high level signal.**
2. **The Module automatically sends eight 40 kHz and detect whether there is a pulse signal back.**
3. **IF the signal back, through high level , time of high output IO duration is the time from sending ultrasonic to returning.**
4. **Test distance = (high level time X velocity of sound (340M/S) / 2.**



B. **GSM 800A Module**

GSM (Global System for Mobile communications) is an open, digital cellular technology used for transmitting mobile voice and data services.



C. GPS MODULE

GPS tracking unit is a device that uses the Global Positioning System to determine the precise location of a vehicle, person, or other asset to which it is attached and to record the position of the asset at regular intervals. The recorded location data can be stored within the tracking unit, or it may be transmitted to a central location data base, or internet-connected computer, using a cellular (GPRS), radio, or satellite modem embedded in the unit.

This allows the asset's location to be displayed against a map backdrop either in real-time or when analysing the track later, using customized software. A GPS tracking system uses the GNSS (Global Navigation Satellite System) network. This network incorporates a range of satellites that use microwave signals which are transmitted to GPS devices to give information on location, vehicle speed, time and direction. So, a GPS tracking system can potentially give both real-time and historic navigation data on any kind of journey. A GPS tracking system can work in various ways. From a commercial perspective,

GPS devices are generally used to record the position of vehicles as they make their journeys. Some systems will store the data within the GPS tracking system itself (known as passive tracking) and some send the information to a centralized database or system via a modem within the GPS system unit on a regular basis (known as active tracking) .



D. HC-05 Bluetooth MODULE

HC-05 module is an easy to use Bluetooth SPP (Serial Port Protocol) module, designed for transparent wireless serial connection setup.

Serial port Bluetooth module is fully qualified Bluetooth V2.0+EDR (Enhanced Data Rate) 3Mbps Modulation with complete 2.4GHz radio transceiver and baseband. It uses CSR Blue core 04 -External single chip Bluetooth system with CMOS technology and with AFH(Adaptive Frequency Hopping Feature). It has the footprint as small as 12.7mmx27mm. Hope it will simplify your overall design/development cycle.



E. Arduino Uno R3

Arduino Uno is a microcontroller board based on the ATmega328P (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz quartz crystal, a USB connection, a power jack, an ICSP header and a reset button.

It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. One can tinker with your UNO without worrying too much about doing something wrong, worst case scenario you can replace the chip for a few dollars and start over again.



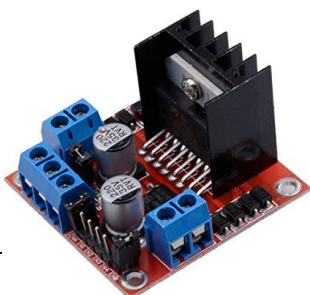
F. H- Bridge Motor Driver

An H-Bridge is a circuit that can drive a current in either polarity and be controlled by Pulse Width Modulation (PWM).

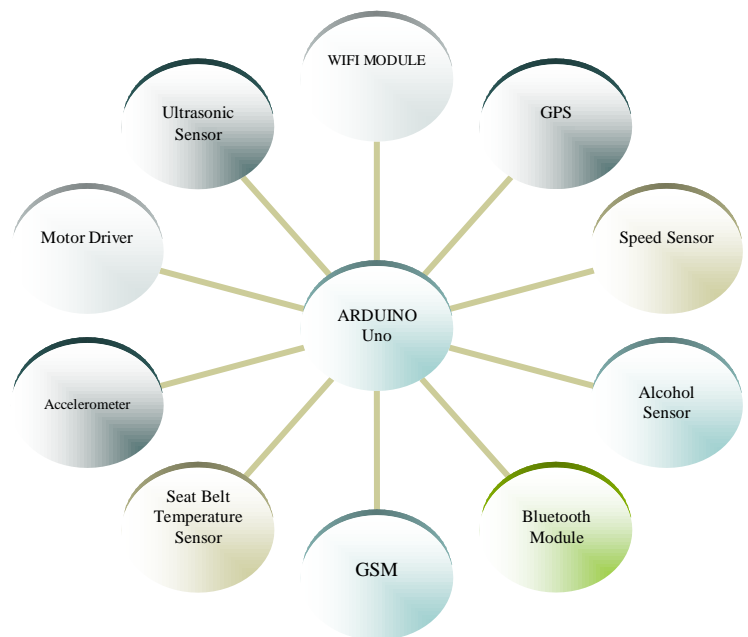
Pulse Width Modulation is a means in controlling the duration of an electronic pulse. In motors try to imagine the brush as a water wheel and electrons as a the flowing droplets of water. The voltage would be the water flowing over the wheel at a constant rate, the more water flowing the higher the voltage.

Motors are rated at certain voltages and can be damaged if the voltage is applied to heavily or if it is dropped quickly to slow the motor down. Thus pwm Take the water wheel analogy and think of the water hitting it in pulses but at a constant flow. The longer the pulses the faster Adaptive Cruise Control with Automobile Black Box

The wheel will turn, the shorter the pulses, the slower the water wheel will turn. Motors will last much longer and be more reliable if controlled through PWM.



V. MODEL BLOCK DIAGRAM OF PROJECT



VI. How Does Robust Cruise Control Works

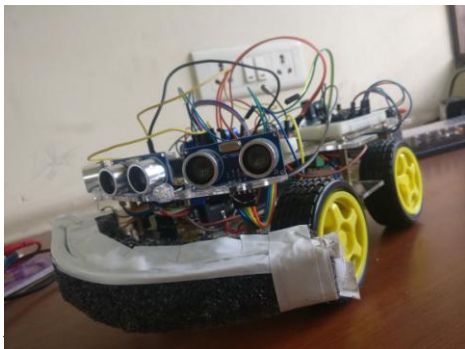
Robust Cruise control is a comparatively humble arrangement that lets a driver to regulate the location of regulates disadvantaged of consuming the gas pedal. It has been about for actual extended period and it often assistances advance fuel cheap at freeway speeds. Though, drivers who use cruise control have to continue continually watchful in contradiction of the actions of other drivers. Most cruise control schemes will shut off if the driver blows the brakes, but they aren't proficient of making involuntary changes to the haste of a wagon.

Robust cruise control is alike in project to more outmoded systems, but there are a few extra mechanisms in production. In its place of trusting on motorist input, robust cruise control schemes make use of laser or radar devices. These sensors are accomplished of noticing the occurrence and haste of other wagons and that info is used to uphold a harmless subsequent reserve. If robust cruise control notices an obstacle in the road, or the principal wagon decelerates down, the system is skilled of cutting the throttle, downshifting, and even triggering the constraints

VI. DATA RECEIVED ON THINKSPEAK API



VI. PROJECT PICTURES



VI. ROBUST CRUISE CONTROL GLOBAL MARKET HIGHLIGHTS

Motorized Robust Cruise Control is chief castoff to controller the swiftness of the wagon. It upholds the swiftness of the automobile by decelerating the car and hurtling up the wagon robotically. The contemporary motorized trade is affecting in the direction of mechanization and electrification. Automotive Robust Cruise Control is the upcoming expertise of brainy cars. It custom several instruments which mechanically senses the remoteness between the two wagons. It upsurges the security and decreases the accidental. Motorized Robust Cruise Control screens the drivers over crash cautioning method that is connected aboard in the wagon. It is too devoted with pre-crash scheme that warnings the vehicle by impulsively smearing constraints. The issues serving the evolution of robust cruise control market are development in expertise, upsurge in sale of inside cars in emergent countries, and rising need for traveller safety. Progressions in expertise have driven the travelers to connect robust cruise control in their automobile for enhanced security. The claim for better traveller security, have headed to increasing use of robust cruise control in their automobile. The augmented use of RCC has headed to development of the marketplace throughout the prediction period.

ACKNOWLEDGEMENT

The presented research is based on the adaptive cruise control system used in autonomous vehicles based on the arduino devices. This will help the driver to automatically control their vehicle without any trouble.

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